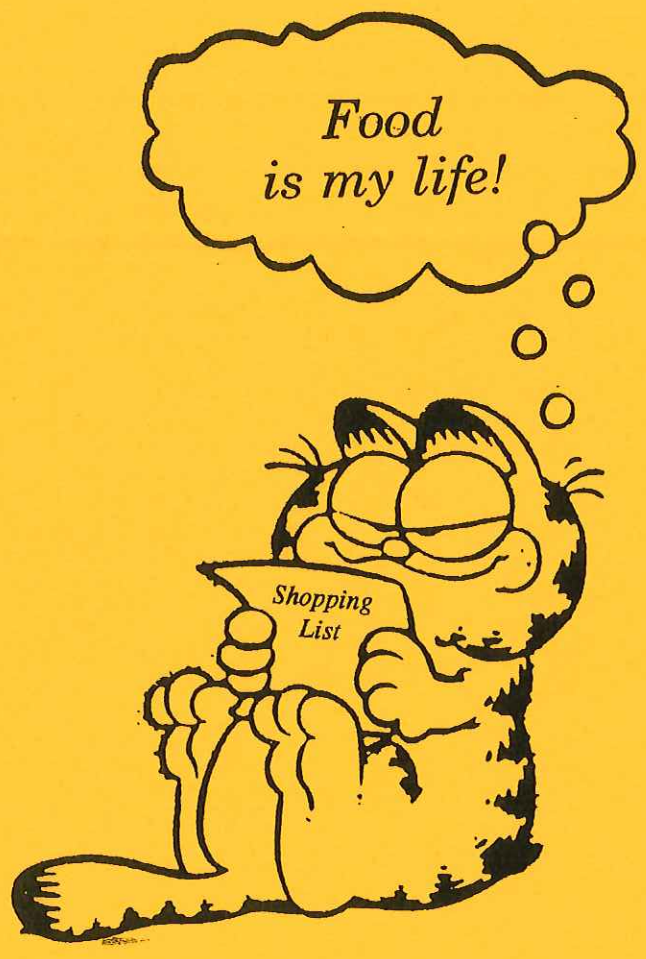
Friendship Jr. High School
Accelerated Math Program



Algebra

3

UNIT #7

Factoring & Problem Solving

UNIT #8

Linear Equations

UNIT #9

Linear Systems

7.1
Answer Key

① m^3+6m^2+9m
$m(m^2+6m+9)$
$\boxed{m(m+3)^2}$

② $18y+12y^2+2y^3$
$2y(9+6y+y^2)$
$\boxed{2y(y+3)^2}$

③ $4a^3-36a$
$4a(a^2-9)$
$\boxed{4a(a+3)(a-3)}$

④ $3x^3-27x$
$3x(x^2-9)$
$\boxed{3x(x+3)(x-3)}$

⑤ m^4-p^2
$\boxed{(m^2+p)(m^2-p)}$

⑥ $5a^2+7a+3$
$\boxed{\text{not factorable}}$

⑦ $3b^2-36$
$3(b^2-12)$
$\boxed{3(b^2-12)}$

⑧ m^3n^2-49m
$m(m^2n^2-49)$
$\boxed{m(mn+7)(mn-7)}$

⑨ $2a^2-4ab-70b^2$
$2(a^2-2ab-35b^2)$
$\boxed{2(a-7b)(a+5b)}$

⑩ $3y^4-48$
$3(y^4-16)$
$3(y^2+4)(y^2-4)$
$\boxed{3(y^2+4)(y+2)(y-2)}$

⑪ $9y^4+8y^2-1$
$9y^4+9y^2-y^2-1$
$9y^2(y^2+1)-1(y^2+1)$
$(y^2+1)(9y^2-1)$
$\boxed{(y^2+1)(3y+1)(3y-1)}$

⑫ $8y^4+14y^2-4$
$2(4y^4+7y^2-2)$
$2(4y^4+8y^2-y^2-2)$
$2[4y^2(y^2+2)-1(y^2+2)]$
$2(y^2+2)(4y^2-1)$
$\boxed{2(y^2+2)(2y+1)(2y-1)}$

⑬ $(3x+2)(x-7)=0$
$\boxed{-\frac{2}{3}, 7}$

⑭ $(x-8)(2x+7)=0$
$\boxed{8, -\frac{7}{2}}$

⑮ $(4x-7)(3x+5)=0$
$\boxed{\frac{7}{4}, -\frac{5}{3}}$

⑯ $(3x-5)(4x-7)=0$
$\boxed{\frac{5}{3}, \frac{7}{4}}$

⑰ $(2x+3)(x+7)=0$
$\boxed{-\frac{3}{2}, -7}$

⑱ $(4x-\frac{1}{3})(3x+\frac{1}{8})=0$
$\frac{1}{3}, \frac{-1}{8} = \boxed{\frac{1}{12}, \frac{-1}{24}}$

⑲ $(n-5)(n+7)=0$
$5, -7$ $\boxed{5}$

⑳ $(n+2)(n-3/4)=0$
$-2, 3/4$
$\boxed{-2}$

7.2
Answer Key

① $x^2=36$
$x^2-36=0$
$(x+6)(x-6)=0$
$\boxed{-6, 6}$

② $y^2=64$
$y^2-64=0$
$(y+8)(y-8)=0$
$\boxed{-8, 8}$

③ $y^2=-5y$
$y^2+5y=0$
$y(y+5)=0$
$\boxed{0, -5}$

④ $\frac{1}{2}y^2-\frac{1}{4}y=0$
$\frac{1}{2}y(y-\frac{1}{2})=0$
$\boxed{0, 1/2}$

⑤ $3y^2-\frac{4}{3}=0$
$\frac{1}{3}(9y^2-4)=0$
$\frac{1}{3}(3y+2)(3y-2)=0$
$\boxed{-2/3, 2/3}$

⑥ $\frac{2}{3}y=\frac{1}{3}y^2$
$\frac{1}{3}y^2-\frac{2}{3}y=0$
$\frac{1}{3}y(y-2)=0$
$\boxed{0, 2}$

⑦ $m^2-24m+144=0$
$(m-12)^2=0$
$\boxed{12}$

⑧ $y^2+10y=-25$
$y^2+10y+25=0$
$(y+5)^2=0$
$\boxed{-5}$

⑨ $n^2-144=0$
$(n+12)(n-12)=0$
$\boxed{-12, 12}$

⑩ $n^2=4$
$n^2-4=0$
$(n+2)(n-2)=0$
~~-2~~, 2 $\boxed{2m}$

⑪ $n^2+6n=0$
$n(n+6)=0$
$\boxed{0, -6}$

⑫ $n^2=10n-25$
$n^2-10n+25=0$
$(n-5)^2=0$
$\boxed{5}$

⑬ Jake $30-n$
Jackie $30+n$
$(30-n)(30+n)=884$
$900-n^2=884$
$n^2-16=0$
$(n+4)(n-4)=0$
~~-4~~, 4

Jake 26	$30-n$
Jackie 34	$30+n$

⑭ $(n-7)(n+7)=51$
$n^2-49=51$
$n^2-100=0$
$(n-10)(n+10)=0$
$\boxed{10, -10}$

7.3
Answer Key

① $p^2=5p+24$
$p^2-5p-24=0$
$(p-8)(p+3)=0$
$\boxed{8, -3}$

② $r^2=18+7r$
$r^2-7r-18=0$
$(r-9)(r+2)=0$
$\boxed{9, -2}$

③ $2t^2+7t=15$
$2t^2+7t-15=0$
$2t^2+10t-3t-15=0$
$2t(t+5)-3(t+5)=0$
$(t+5)(2t-3)=0$
$\boxed{-5, 3/2}$

④ $3y^2-7y=20$
$3y^2-7y-20=0$
$3y^2-12y+5y-20=0$
$3y(y-4)+5(y-4)=0$
$(y-4)(3y+5)=0$
$\boxed{4, -5/3}$

⑤ $6z^2+5=-17z$
$6z^2+17z+5=0$
$6z^2+15z+2z+5=0$
$3z(2z+5)+1(2z+5)=0$
$(2z+5)(3z+1)=0$
$\boxed{-5/2, -1/3}$

⑥ $12m^2+3=-20m$
$12m^2+20m+3=0$
$12m^2+18m+2m+3=0$
$6m(2m+3)+1(2m+3)=0$
$(2m+3)(6m+1)=0$
$\boxed{-3/2, -1/6}$

⑦ $r^3-6r^2+8r=0$
$r(r^2-6r+8)=0$
$r(r-4)(r-2)=0$
$\boxed{0, 4, 2}$

⑧ $s^3+2s^2-35s=0$
$s(s^2+2s-35)=0$
$s(s+7)(s-5)=0$
$\boxed{0, -7, 5}$

⑨ $(x+8)(x+1)=-12$
$x^2+9x+8=-12$
$x^2+9x+20=0$
$(x+5)(x+4)=0$
$\boxed{-5, -4}$

⑩ $(r-1)(r-1)=36$
$r^2-2r+1=36$
$r^2-2r-35=0$
$(r-7)(r+5)=0$
$\boxed{7, -5}$

⑪ $(3y+2)(y+3)=y+14$
$3y^2+11y+6=y+14$
$3y^2+10y-8=0$
$3y^2+12y-2y-8=0$
$3y(y+4)-2(y+4)=0$
$(y+4)(3y-2)=0$
$\boxed{-4, 2/3}$

⑫ $(y+4)(3y-2)=-y-14$
$3y^2+10y-8=-y-14$
$3y^2+11y+6=0$
$3y^2+9y+2y+6=0$
$3y(y+3)+2(y+3)=0$
$(y+3)(3y+2)=0$
$\boxed{-3, -2/3}$

⑬

n	$n+2$
-12	10
-10	12

$(n)(n+2)=120$
$n^2+2n-120=0$
$(n+12)(n-10)=0$
$-12 \quad 10$

⑭

n	$n+2$
-20	18
-18	20

$(n)(n+2)=360$
$n^2+2n-360=0$
$(n+20)(n-18)=0$
$-20 \quad 18$

⑮

n	$n+1$
6	7

$(n)(n+1)=42$
$n^2+n-42=0$
$(n+7)(n-6)=0$
$-7 \quad 6$

⑯

n	$n+1$
-8	-7

$(n)(n+1)=56$
$n^2+n-56=0$
$(n+8)(n-7)=0$
$-8 \quad \cancel{7}$

7.4
Answer Key

①

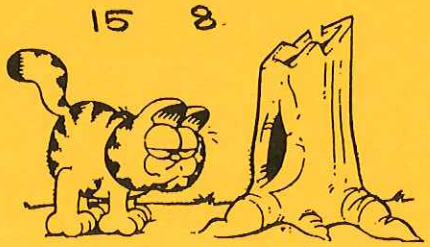
n	$n-3$
11	-8
8	-11

$(n)(n-3)=88$
$n^2-3n-88=0$
$(n-11)(n+8)=0$
$11 \quad -8$

②

n	$n-23$
15	8
-8	-15

$(n)(n-23)=-120$
$n^2-23n+120=0$
$(n-15)(n-8)=0$
$15 \quad 8$



③ n | 9
$n+2$ | 11

$(n)^2+(n+2)^2=202$
$(n)^2+(n^2+4n+4)=202$
$2n^2+4n-198=0$
$2(n^2+2n-99)=0$
$2(n+11)(n-9)=0$
$-11 \quad 9$

④ n | 7
$n+1$ | 8

$(n)^2+(n+1)^2=113$
$n^2+(n^2+2n+1)=113$
$2n^2+2n-112=0$
$2(n^2+n-56)=0$
$2(n+8)(n-7)=0$
$-8 \quad 7$

⑤ n | 9
$13-n$ | 4

$(n)^2+(13-n)^2=97$
$n^2+(169-26n+n^2)=97$
$2n^2-26n+72=0$
$2(n^2-13n+36)=0$
$2(n-9)(n-4)=0$
$9 \quad 4$

⑥ n | 11
$3-n$ | -8

$(n)^2+(3-n)^2=185$
$n^2+(9-6n+n^2)=185$
$2n^2-6n-176=0$
$2(n^2-3n-88)=0$
$2(n-11)(n+8)=0$
$11 \quad -8$

⑦ n | -8 | 5
$n+1$ | -7 | 6

$n+(n+1)^2=41$
$n+(n^2+2n+1)=41$
$n^2+3n+1=41$
$n^2+3n-40=0$
$(n+8)(n-5)=0$
$-8 \quad 5$

⑧ n | -9 | 6
$n+1$ | -8 | 7

$n+(n+1)^2=55$
$n+(n^2+2n+1)=55$
$n^2+3n+1=55$
$n^2+3n-54=0$
$(n+9)(n-6)=0$
$-9 \quad 6$

⑨ $5b^3+34b^2=7b$
$5b^3+34b^2-7b=0$
$b(5b^2+34b-7)=0$
$b(5b^2+35b-b-7)=0$
$b[5b(b+7)-1(b+7)]=0$
$b(b+7)(5b-1)=0$
$0, -7, 1/5$

⑩ $2k^3+5k^2=42k$
$2k^3+5k^2-42k=0$
$k(2k^2+5k-42)=0$
$k(2k^2+12k-7k-42)=0$
$k[2k(k+6)-7(k+6)]=0$
$k(k+6)(2k-7)$
$0, -6, 7/2$

⑪ $y^4-8y^2+16=0$
$(y^2-4)(y^2-4)=0$
$(y+2)(y-2)(y+2)(y-2)=0$
$-2, 2$

⑫ $m^4-2m^2+1=0$
$(m^2-1)(m^2-1)=0$
$(m+1)(m-1)(m+1)(m-1)=0$
$-1, 1$

7.5
Answer Key

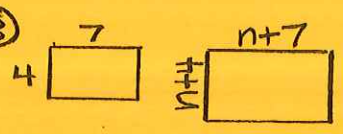
① n | $n+3$

$n(n+3)=40$
$n^2+3n-40=0$
$(n+8)(n-5)=0$
$-8 \quad 5$
5 by 8 m

② n | $n+5$

$n(n+5)=234$
$n^2+5n-234=0$
$(n+18)(n-13)=0$
$-18 \quad 13$
13 by 18 yds

③



$(n+7)(n+4)-(4)(7)=26$

$n^2+11n+28-28=26$

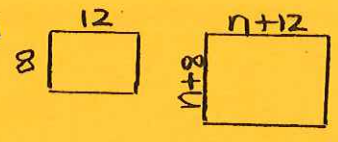
$n^2+11n-26=0$

$(n+13)(n-2)=0$

$-13 \quad 2$

$n+7$, $n+4$ → 9 in, 6 in

④



$(n+12)(n+8)=2(96)$

$n^2+20n+96=192$

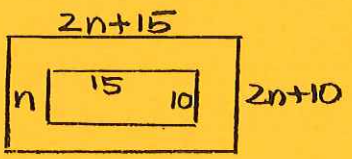
$n^2+20n-96=0$

$(n+24)(n-4)=0$

$-24 \quad 4$

$n+12$, $n+8$ → 16, 12 in

⑤



$(2n+15)(2n+10)=2(150)$

$4n^2+50n+150=300$

$4n^2+50n-150=0$

$2(2n^2+25n-75)=0$

$2(2n^2+30n-5n-75)=0$

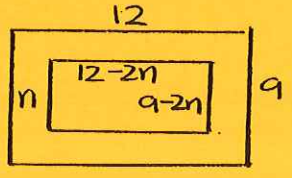
$2[2n(n+15)-5(n+15)]=0$

$2(n+15)(2n-5)$

$-15 \quad 5/2$

5/2 feet

⑥



$(12-2n)(9-2n)=\frac{1}{2}(108)$

$108-42n+4n^2=54$

$4n^2-42n+54=0$

$2(2n^2-21n+27)=0$

$2(2n^2-18n-3n+27)=0$

$2[2n(n-9)-3(n-9)]=0$

$2(n-9)(2n-3)$

$9 \quad 3/2$

3½ feet

⑦ $h=vt-16t^2$

$0=192t-16t^2$

$16t^2-192t=0$

$16t(t-12)=0$

$0 \quad 12$

12 seconds

⑧ $h=vt-16t^2$

$0=64t-16t^2$

$16t^2-64t=0$

$16t(t-4)=0$

$0 \quad 4$

4 seconds

⑨ $816=1640t-16t^2$

$16t^2-1640t+816=0$

$8(2t^2-205t+102)=0$

$8(2t^2-204t-t+102)=0$

$8[2t(t-102)-1(t-102)]=0$

$8(t-102)(2t-1)$

$102 \quad 1/2$

½ and 102 seconds

⑩ $0=128t-16t^2$

$16t^2-128t=0$

$16t(t-8)=0$

$0 \quad 8$

8 sec.

⑪

n	−12	6
$n+2$	−10	8

$2n+(n+2)^2=76$

$2n+(n^2+4n+4)=76$

$n^2+6n-72=0$

$(n+12)(n-6)=0$

$-12 \quad 6$

⑫

n	−14	8
$n+2$	−12	10

$2n+(n+2)^2=116$

$2n+(n^2+4n+4)=116$

$n^2+6n-112=0$

$(n+14)(n-8)=0$

$-14 \quad 8$

Unit 7
REVIEW
Answer Key

① $(4x-3)(2x+1/2)=0$

3/4, −1/4

② $(x+\frac{2}{3})(3x-5)=0$

−2/3, 5/3

③ $n^2=81$

$n^2-81=0$

$(n+9)(n-9)=0$

−9, 9

④ $y^2-100=0$
$(y+10)(y-10)=0$
$\boxed{-10, 10}$

⑤ $2x^2+5x=12$
$2x^2+5x-12=0$
$2x^2+8x-3x-12=0$
$2x(x+4)-3(x+4)=0$
$(x+4)(2x-3)=0$
$\boxed{-4, 3/2}$

⑥ $4n^2-5n=6$
$4n^2-5n-6=0$
$4n^2-8n+3n-6=0$
$4n(n-2)+3(n-2)=0$
$\boxed{2, -3/4}$

⑦ $(x+3)(x-5)=9$
$x^2-2x-15=9$
$x^2-2x-24=0$
$(x-6)(x+4)=0$
$\boxed{6, -4}$

⑧ $(x-3)^2=16$
$x^2-6x+9=16$
$x^2-6x-7=0$
$(x-7)(x+1)=0$
$\boxed{7, -1}$

⑨ $2n^3-5n=-9n^2-$
$2n^3+9n^2-5n=0$
$n(2n^2+9n-5)=0$
$n(2n^2+10n-n-5)=0$
$n[2n(n+5)-1(n+5)]=0$
$n(n+5)(2n-1)=0$
$\boxed{0, -5, 1/2}$

⑩ $6x^3-2x=-x^2$
$6x^3+x^2-2x=0$
$x(6x^2+x-2)=0$
$x(6x^2+4x-3x-2)=0$
$x[2x(3x+2)-1(3x+2)]=0$
$x(3x+2)(2x-1)=0$
$\boxed{0, -2/3, 1/2}$

⑪ $n^4-5n^2+4=0$
$(n^2)^2-5n^2+4=0$
$(n^2-4)(n^2-1)=0$
$(n+2)(n-2)(n+1)(n-1)=0$
$\boxed{-2, 2, -1, 1}$

⑫ $x^4-17x^2+16=0$
$(x^2)^2-17x^2+16=0$
$(x^2-16)(x^2-1)=0$
$(x+4)(x-4)(x+1)(x-1)=0$
$\boxed{-4, 4, -1, 1}$

⑬

n	$\boxed{-5}$
$n+1$	$\boxed{-4}$

$n(n+1)=20$
$n^2+n-20=0$
$(n+5)(n-4)=0$
$-5 \quad 4$

⑭

n	$\boxed{9}$	$\boxed{-5}$
$n-4$	$\boxed{5}$	$\boxed{-9}$

$n(n-4)=45$
$n^2-4n-45=0$
$(n-9)(n+5)=0$
$9 \quad -5$

⑮

n	$\boxed{8}$	3
$11-n$	$\boxed{3}$	8

$n(11-n)=24$
$11n-n^2=24$
$n^2-11n+24=0$
$(n-8)(n-3)=0$
$8 \quad 3$

⑯

n	$\boxed{7}$	3
$10-n$	$\boxed{3}$	7

$n^2+(10-n)=58$
$n^2+(100-20n+n^2)=58$
$2n^2-20n+42=0$
$2(n^2-10n+21)=0$
$2(n-7)(n-3)=0$
$7 \quad 3$

⑰

n	$\boxed{4}$
$n+2$	$\boxed{6}$

$n+(n+2)^2=40$
$n+(n^2+4n+4)=40$
$n^2+5n-36=0$
$(n+9)(n-4)=0$
$-9 \quad 4$

⑱

n	$\boxed{3}$
$n+2$	$\boxed{5}$

$2n+(n+2)^2=31$
$2n+(n^2+4n+4)=31$
$n^2+6n-27=0$
$(n+9)(n-3)=0$
$-9 \quad 3$

(19) $h = vt - 16t^2$

$0 = 80t - 16t^2$

$0 = 16t(5-t)$

$\not{0}$ 5

5 seconds

(20) $h = vt - 16t^2$

$784 = 800t - 16t^2$

$16t^2 - 800t + 784 = 0$

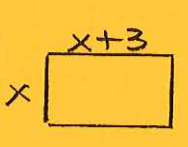
$16(t^2 - 50t + 49) = 0$

$16(t-49)(t-1) = 0$

49 1

after 1 second on the way up and after 49 seconds on the way down

(21)



$x(x+3) = 70$

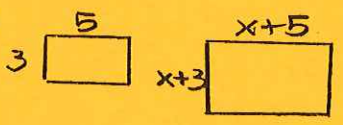
$x^2 + 3x - 70 = 0$

$(x+10)(x-7) = 0$

$-\not{10}$ 7

7 by 10 feet

(22)



$(x+3)(x+5) = (3)(5) + 48$

$x^2 + 8x + 15 = 63$

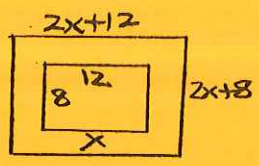
$x^2 + 8x - 48 = 0$

$(x+12)(x-4) = 0$

-12 4

7 by 9 inches

(23)



$(2x+12)(2x+8) = 2(8)(12)$

$4x^2 + 40x + 96 = 192$

$4x^2 + 40x - 96 = 0$

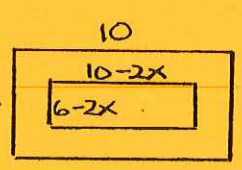
$4(x^2 + 10x - 24) = 0$

$4(x+12)(x-2) = 0$

-12 2

2 feet

(24)



$(6-2x)(10-2x) = (6)(10) - 28$

$60 - 32x + 4x^2 = 32$

$4x^2 - 32x + 28 = 0$

$4(x^2 - 8x + 7) = 0$

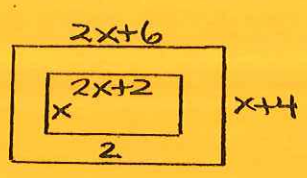
$4(x-7)(x-1) = 0$

$\not{7}$ 1

$10 - 2x =$ **8cm**

$6 - 2x =$ **4cm**

(25)



$(2x+6)(x+4) - x(2x+2) = 96$

$(2x^2 + 14x + 24) - (2x^2 + 2x) = 96$

$2x^2 + 14x + 24 - 2x^2 - 2x = 96$

$12x + 24 = 96$

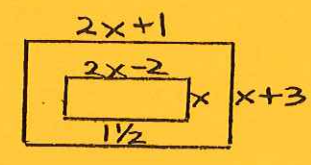
$12x = 72$

$x = 6$

$2x+6 =$ **18 in**

$x+4 =$ **10 in**

(26)



$(2x+1)(x+3) - (x)(2x-2) = 48$

$(2x^2 + 7x + 3) - (2x^2 - 2x) = 48$

$2x^2 + 7x + 3 - 2x^2 + 2x = 48$

$9x + 3 = 48$

$9x = 45$

$x = 5$

$2x - 2 = 8$

5 by 8 cm

Unit 7
SKILL CHECK - KEY

① $n^2 = 121$

$n^2 - 121 = 0$

$(n+11)(n-11) = 0$

-11, 11

② $(3x-5)(2x+7) = 0$

5/3, -7/2

③ $a^2 + 4a = 12$

$a^2 + 4a - 12 = 0$

$(a+6)(a-2) = 0$ **-6, 2**

④ $6x^3 - 6x = 5x^2$

$6x^3 - 5x^2 - 6x = 0$

$x(6x^2 - 5x - 6) = 0$

$x(6x^2 - 9x + 4x - 6) = 0$

$x[3x(2x-3) + 2(2x-3)] = 0$

$x(2x-3)(3x+2) = 0$

0, 3/2, -2/3

⑤ $(x+3)(x-7)=11$

$x^2-4x-21=11$

$x^2-4x-32=0$

$(x-8)(x+4)=0$

$\boxed{8, -4}$

⑥ $n^4-26n^2+25=0$

$(n^2)^2-26n^2+25=0$

$(n^2-25)(n^2-1)=0$

$(n+5)(n-5)(n+1)(n-1)=0$

$\boxed{-5, 5, -1, 1}$

⑦

n	12	-7
$n-5$	7	-12

$n(n-5)=84$

$n^2-5n-84=0$

$(n-12)(n+7)=0$

$12 \quad -7$

⑧

n	-8	6
$n+2$	-6	8

$n^2+(n+2)^2=100$

$n^2+(n^2+4n+4)=100$

$2n^2+4n-96=0$

$2(n^2+2n-48)=0$

$2(n+8)(n-6)=0$

$-8 \quad 6$

⑨

n	-9
$n+2$	-7

$3n+(n+2)^2=22$

$3n+(n^2+4n+4)=22$

$n^2+7n-18=0$

$(n+9)(n-2)=0$

$-9 \quad 2$

⑩ $h=vt-16t^2$

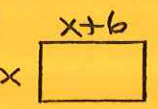
$0=128t-16t^2$

$0=16t(8-t)$

$0 \quad 8$

$\boxed{8 \text{ seconds}}$

⑪



$x(x+6)=55$

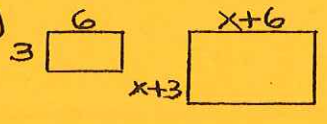
$x^2+6x-55=0$

$(x+11)(x-5)=0$

$-11 \quad 5$

$\boxed{5 \text{ by } 11 \text{ cm}}$

⑫



$(x+3)(x+6)=(3)(6)+70$

$x^2+9x+18=88$

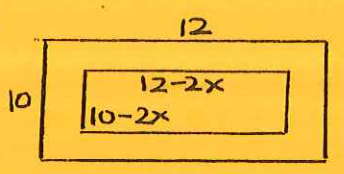
$x^2+9x-70=0$

$(x+14)(x-5)=0$

$-14 \quad 5$

$\boxed{8 \text{ by } 11 \text{ feet}}$

⑬



$(12-2x)(10-2x)=80$

$120-44x+4x^2=80$

$4x^2-44x+40=0$

$4(x^2-11x+10)=0$

$4(x-10)(x-1)=0$

$10 \quad 1$

$\boxed{1 \text{ foot wide}}$

Unit 7
REMEDIATION - KEY

① $x^2=49$

$x^2-49=0$

$(x+7)(x-7)=0$

$\boxed{-7, 7}$

② $(4n-5)(3n+2)=0$

$\boxed{5/4, -2/3}$

③ $n^2-n=30$

$n^2-n-30=0$

$(n-6)(n+5)=0$

$\boxed{6, -5}$

④ $8n^3-5n=18n^2$

$8n^3-18n^2-5n=0$

$n(8n^2-18n-5)=0$

$n(8n^2-20n+2n-5)=0$

$n[4n(2n-5)+1(2n-5)]=0$

$n(2n-5)(4n+1)=0$

$\boxed{0, 5/2, -1/4}$

⑤ $(n+4)(n-9)=14$

$n^2-5n-36=14$

$n^2-5n-50=0$

$(n-10)(n+5)=0$

$\boxed{10, -5}$

⑥ $x^4-13x^2+36=0$

$(x^2)^2-13x^2+36=0$

$(x^2-9)(x^2-4)=0$

$(x+3)(x-3)(x+2)(x-2)=0$

$\boxed{-3, 3, -2, 2}$

⑦

x	9	-3
$x-6$	3	-9

$x(x-6)=27$

$x^2-6x-27=0$

$(x-9)(x+3)=0$

$9 \quad -3$

⑧

n	-7	5
$n+2$	-5	7

$n^2+(n+2)^2=74$

$n^2+(n^2+4n+4)=74$

$2n^2+4n-70=0$

$2(n^2+2n-35)=0$

$2(n+7)(n-5)=0$

$-7 \quad 5$

⑨

n	6
$n+2$	8

$4n+(n+2)^2=88$

$4n+(n^2+4n+4)=88$

$n^2+8n-84=0$

$(n+14)(n-6)=0$

$-14 \quad 6$

⑩ $h=vt-16t^2$

$0=160t-16t^2$

$0=16t(10-t)$

$0 \quad 10$

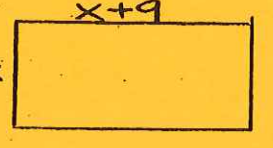
$\boxed{10 \text{ seconds}}$

⑪ $x(x+9)=70$

$x^2+9x-70=0$

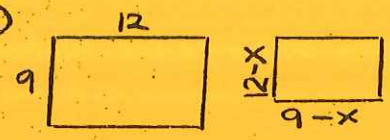
$(x+14)(x-5)=0$

$-14 \quad 5$



$\boxed{5 \text{ by } 14 \text{ feet}}$

⑫



$(9-x)(12-x)=40$

$108-21x+x^2=40$

$x^2-21x+68=0$

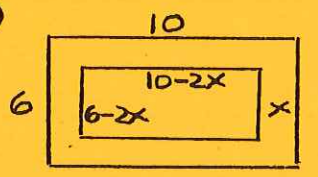
$(x-17)(x-4)=0$

$17 \quad 4$

$9-x=$ 5 feet

$12-x=$ 8 feet

⑬



$(10-2x)(6-2x)=45$

$60-32x+4x^2=45$

$4x^2-32x+15=0$

$4x^2-30x-2x+15=0$

$2x(2x-15)-1(2x-15)=0$

$(2x-15)(2x-1)=0$

$15/2 \quad 1/2$

$\boxed{1/2 \text{ cm wide}}$

Unit 7
EXTRA PRACTICE - ANSWER KEY

① $n^2-9=40$

$n^2-49=0$

$(n+7)(n-7)=0$

$\boxed{-7, 7}$

② $(4x-1)(3x+5)=0$

$\boxed{1/4, -5/3}$

③ $n^2-9n+20=0$

$(n-5)(n-4)=0$

$\boxed{5, 4}$

④ $(x-5)^2=0$ $\boxed{5}$

⑤ $3x^2+5x-2=0$

$3x^2+6x-x-2=0$

$3x(x+2)-1(x+2)=0$

$(x+2)(3x-1)=0$

$\boxed{-2, 1/3}$

⑥ $(x+3)(x-2)=14$

$x^2+x-6=14$

$x^2+x-20=0$

$(x+5)(x-4)=0$ $\boxed{-5, 4}$

⑦ $n^2-2n-15=0$

$(n-5)(n+2)=0$ $\boxed{5, -2}$

⑧ $2n^3-7n^2+3n=0$

$n(2n^2-7n+3)=0$

$n(2n^2-6n-n+3)=0$

$n[2n(n-3)-1(n-3)]=0$

$n(n-3)(2n-1)=0$ $\boxed{0, 3, 1/2}$

⑨ $x^2-64=0$

$(x+8)(x-8)=0$

$\boxed{-8, 8}$

⑩ $(n+4)(3n-2)=0$

$\boxed{-4, \frac{2}{3}}$

⑪ $2x^2+x=15$

$2x^2+x-15=0$

$2x^2+6x-5x-15=0$

$2x(x+3)-5(x+3)=0$

$(x+3)(2x-5)=0$

$\boxed{-3, 5/2}$

⑫ $n^4-17n^2+16=0$

$(n^2)^2-17n^2+16=0$

$(n^2-16)(n^2-1)=0$

$(n+4)(n-4)(n+1)(n-1)=0$

$\boxed{4, -4, 1, -1}$

⑬

n	$\boxed{-6}$
$n+1$	$\boxed{-5}$

$n(n+1)=30$

$n^2+n-30=0$

$(n+6)(n-5)=0$

$-6 \quad \cancel{5}$

⑭

n	$\boxed{9}$	$\boxed{-6}$
$n-3$	$\boxed{6}$	$\boxed{-9}$

$n(n-3)=54$

$n^2-3n-54=0$

$(n-9)(n+6)=0$

$9 \quad -6$

⑮

n	$\boxed{6}$	$\boxed{-8}$
$n+2$	$\boxed{8}$	$\boxed{-6}$

$n^2+(n+2)^2=100$

$n^2+n^2+4n+4=100$

$2n^2+4n-96=0$

$n^2+2n-48=0$

$(n-6)(n+8)=0$

$6 \quad -8$

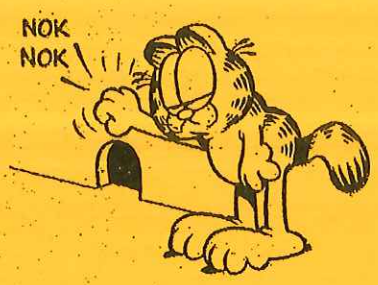
⑯ $h=vt-16t^2$

$0=80t-16t^2$

$0=16t(5-t)$

$0 \quad 5$

$\boxed{5 \text{ seconds}}$

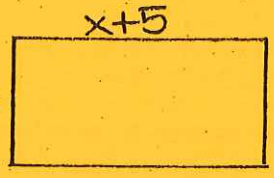


⑰ $x(x+5)=84$

$x^2+5x-84=0$

$(x+12)(x-7)=0$

$-12 \quad 7$



$\boxed{7 \text{ by } 12 \text{ feet}}$

⑱ $(x+4)(x+7)-(4)(7)=42$

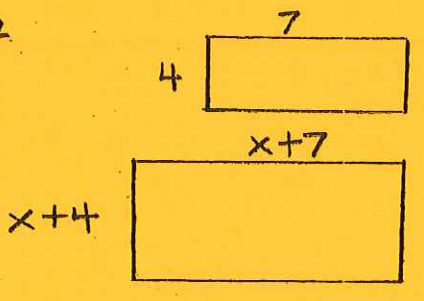
$x^2+11x+28-28=42$

$x^2+11x-42=0$

$(x+14)(x-3)=0$

$-14 \quad 3$

$\boxed{7 \text{ by } 10 \text{ inches}}$



⑲

n	-1	$\boxed{-7}$
$n+2$	1	$\boxed{-5}$

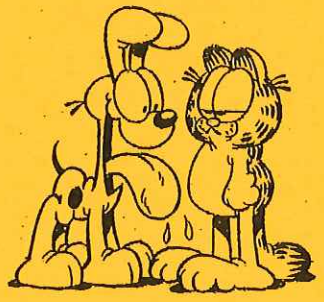
$4n+(n+2)^2=-3$

$4n+n^2+4n+4=-3$

$n^2+8n+7=0$

$(n+1)(n+7)=0$

$-1 \quad -7$



⑳ $(9)(10)-(9-2x)(10-2x)=18$

$90-(90-38x+4x^2)=18$

$90-90+38x-4x^2=18$

$90-90+38x-4x^2-18=0$

$-4x^2+38x-18=0$

$2x^2-19x+9=0$

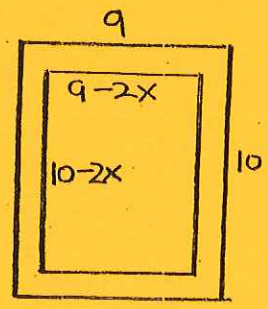
$2x^2-18x-x+9=0$

$2x(x-9)-1(x-9)=0$

$(x-9)(2x-1)=0$

$9 \quad 1/2$

$\boxed{1/2 \text{ cm}}$



8.1
Answer Key

① II ⑤ origin
② III ⑥ II
③ I ⑦ III
④ IV ⑧ I

⑨ (2,-1) (3,-3) (5,2) (8,6)

⑩ (4,2) (5,1) (-3,6) (-3,0)

⑪ {2,3,5,8}

⑫ {2,1,6,0}

⑬ yes ⑱ no
⑭ yes ⑲ yes
⑮ yes ⑳ no
⑯ no ㉑ no
⑰ yes ㉒ yes

㉓ yes ㉘ yes
㉔ no ㉙ yes
㉕ no ㉚ no
㉖ yes ㉛ yes
㉗ yes

㉜ $f(x)=3x-5$
$f(-3)=3(-3)-5$
$\boxed{-14}$

㉝ $f(x)=2x-1$
$f(-1)=2(-1)-1$
$\boxed{-3}$

㉞ $f(x)=x^2-x$
$f(-1)=(-1)^2-(-1)$
$\boxed{2}$

㉟ $f(x)=x^2-2x$
$f(2n)=(2n)^2-2(2n)$
$\boxed{4n^2-4n}$

㊱ $f(x)=3x^2-x$
$f(a+1)=3(a+1)^2-(a+1)$
$3(a^2+2a+1)-(a+1)$
$3a^2+6a+3-a-1$
$\boxed{3a^2+5a+2}$

㊲ $g(x)=2x+x$
$g(-3)=2(-3)+(-3)=-9$
$f(x)=x^2+3x$
$f(-9)=(-9)^2+3(-9)$
$\boxed{54}$

㊳ $g(x)=x^2-x$
$g(-2)=(-2)^2-(-2)=6$
$f(x)=2x-x$
$F(6)=2(6)-(6)$
$\boxed{6}$

8.2
Answer Key

① $-15/8$ ⑨ 0
② -7 ⑩ $-4/5$
③ 2 ⑪ $-1/10$
④ $-3/8$ ⑫ 0
⑤ $-4/5$ ⑬ 1
⑥ undef. ⑭ 4
⑦ 3/4 ⑮ undef.
⑧ 1/2

⑯ (-3,-5) (-8,+5)
$\frac{(-5)-(+5)}{(-3)-(-8)}=\frac{-10}{5}=\boxed{-2}$

⑰ (0,-3) (-7,+3)
$\boxed{\frac{(-3)-(+3)}{(0)-(-7)}=\frac{-6}{7}}$

⑱ (-2,-4) (-2,-8)
$\frac{(-4)-(-8)}{(-2)-(-2)}=\frac{4}{0}$
$\boxed{\text{undefined}}$

⑲ (6,8) (-4,-3)
$\boxed{\frac{(8)-(-3)}{(6)-(-4)}=\frac{11}{10}}$

⑳ (-4,2) (-9,2)
$\frac{(2)-(2)}{(-4)-(-9)}=\frac{0}{5}=\boxed{0}$

(21) $(-6,-1)\ (0,-9)$

$$\frac{(-1)-(-9)}{(-6)-(0)} = \frac{8}{-6} = \boxed{\frac{-4}{3}}$$

(22) $(-3,4)\ (-3,-3)$

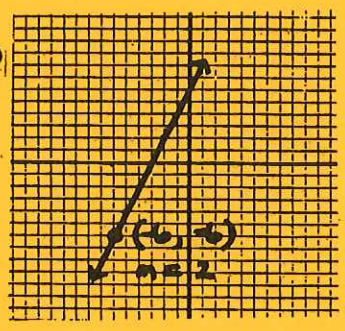
$$\frac{(4)-(-3)}{(-3)-(-3)} = \frac{7}{0}$$

undefined

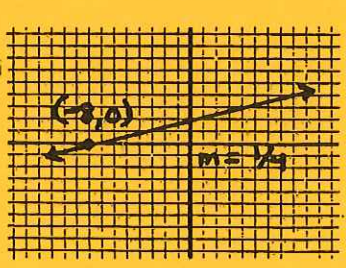
(23) $(4,-1)\ (6,-1)$

$$\frac{(-1)-(-1)}{(4)-(6)} = \frac{0}{-2} = \boxed{0}$$

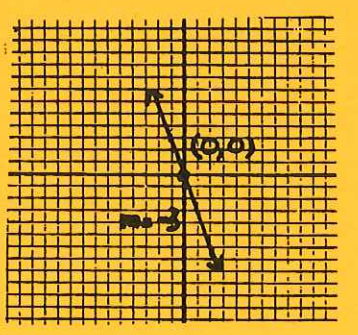
(24)



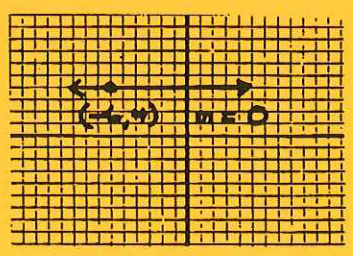
(25)



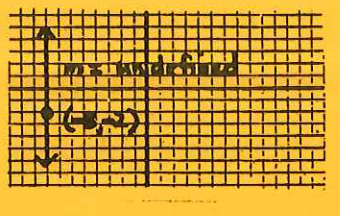
(26)



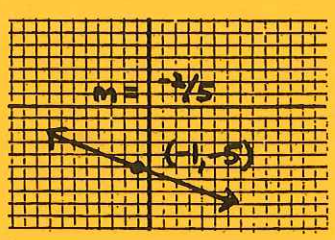
(27)



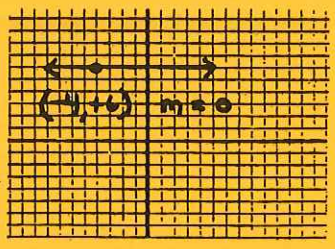
(28)



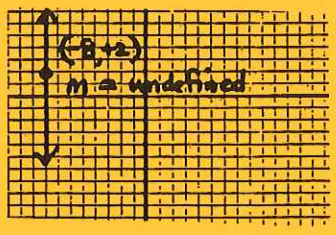
(29)



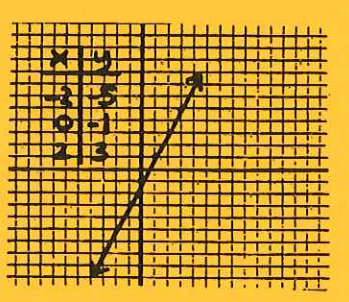
(30)



(31)

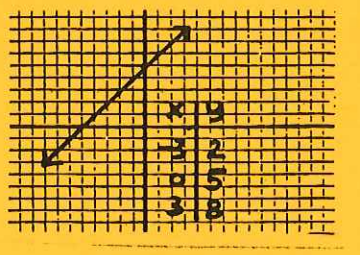


(32)



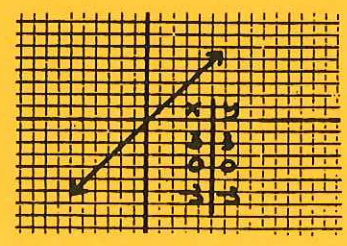
x	y
-3	5
0	-1
2	3

(33)



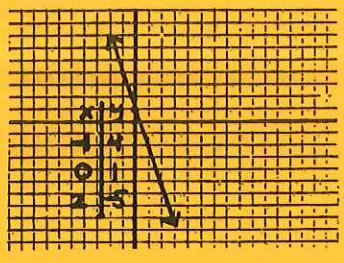
x	y
-3	2
0	5
3	8

(34)



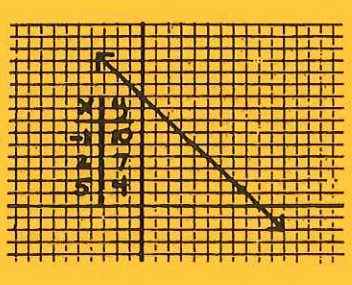
x	y
3	3
0	0
-3	-3

(35)



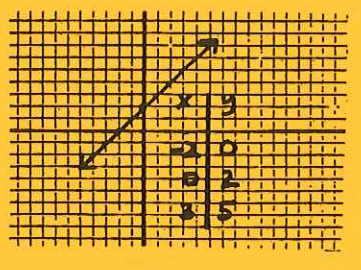
x	y
-1	4
0	1
2	-5

(36)



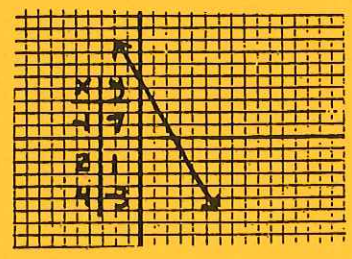
x	y
-1	10
2	7
5	4

(37)



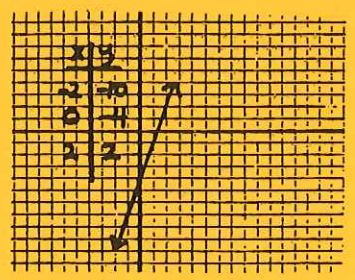
x	y
-2	0
0	2
3	5

(38)



x	y
-1	7
2	1
4	-3

(39)



x	y
-2	-10
0	-4
3	2

(40) **Quadrant III**

(41) Not a function

Domain:
$\{-2, 0, 2, 5\}$

Range:
$\{-3, 1, 4, 6, 9\}$

(42) $3x = 9$ yes

$x^2 + y = 1$ no

$y = \frac{x}{3}$ yes

(43) $g(x) = x^2$

$g(n+1) = (n+1)^2$

$n^2 + 2n + 1$

$F(x) = 2x - 3$

$f(n^2+2n+1) =$

$2(n^2+2n+1) - 3$

$2n^2 + 4n + 2 - 3$

$\boxed{2n^2 + 4n - 1}$

8.3
Answer Key

(1) Standard: $y = 3x - 9$; $-3x + y = -9$; $\boxed{3x - y = 9}$

Slope-Int: $\boxed{y = 3x - 9}$

$-A/B = 3$ slope $m = 3$

$C/B = -9$ y-int $b = -9$

$C/A = 3$ x-int $-b/m = 3$

$\boxed{3}$ $\boxed{(0,-9)}$ $\boxed{(3,0)}$

(2) Standard: $y = -2x + 8$; $\boxed{2x + y = 8}$

Slope-Int: $\boxed{y = -2x + 8}$

$-A/B = -2$ slope $m = -2$

$C/B = 8$ y-int $b = 8$

$C/A = 4$ x-int $-b/m = 4$

$\boxed{-2}$ $\boxed{(0,8)}$ $\boxed{(4,0)}$

(3) Standard: $6x - 2y = 4$; $\boxed{3x - y = 2}$

Slope-Int: $6x - 2y = 4$; $-2y = -6x + 4$; $\boxed{y = 3x - 2}$

$-A/B = 3$ slope $m = 3$

$C/B = -2$ y-int $b = -2$

$C/A = 2/3$ x-int $-b/m = 2/3$

$\boxed{3}$ $\boxed{(0,-2)}$ $\boxed{(\frac{2}{3},0)}$

(4) Standard: $-8x - 4y = 12$; $8x + 4y = -12$; $\boxed{2x + y = -3}$

Slope-Int: $-8x - 4y = 12$; $-4x = 8x + 12$; $\boxed{y = -2x - 3}$

$-A/B = -2$ slope $m = -2$

$C/B = -3$ y-int $b = -3$

$C/A = -3/2$ x-int $-b/m = -3/2$

$\boxed{-2}$ $\boxed{(0,-3)}$ $\boxed{(-\frac{3}{2},0)}$

(5) Standard: $\frac{1}{3}x - y = 2$; $\boxed{x - 3y = 6}$

Slope-Int: $\frac{1}{3}x - y = 2$; $-y = -\frac{1}{3}x + 2$; $\boxed{y = \frac{1}{3}x - 2}$

$-A/B = 1/3$ slope $m = 1/3$

$C/B = -2$ y-int $b = -2$

$C/A = 6$ x-int $-b/m = 6$

$\boxed{1/3}$ $\boxed{(0,-2)}$ $\boxed{(6,0)}$

⑥ Standard

$\frac{2}{5}x + y = 4$

$\boxed{2x + 5y = 20}$

$-A/B = -2/5$ Slope
$C/B = 4$ y-int
$C/A = 10$ x-int

Slope-Int

$\frac{2}{5}x + y = 4$

$\boxed{y = \frac{-2}{5}x + 4}$

$m = -2/5$
$b = 4$
$-b/m = 10$

$\boxed{\begin{matrix} \frac{-2}{5} \\ (0,4) \\ (10,0) \end{matrix}}$

⑦ Standard

$3x = 9 - 6y$

$3x + 6y = 9$

$\boxed{x + 2y = 3}$

$-A/B = -1/2$ Slope
$C/B = 3/2$ y-int
$C/A = 3$ x-int

Slope-Int

$3x = 9 - 6y$

$6y = -3x + 9$

$\boxed{y = \frac{-1}{2}x + \frac{3}{2}}$

$m = -1/2$
$b = 3/2$
$-b/m = 3$

$\boxed{\begin{matrix} -1/2 \\ (0, 3/2) \\ (3,0) \end{matrix}}$

⑧ Standard

$-x = 12 - 2y$

$-x + 2y = 12$

$\boxed{x - 2y = -12}$

$-A/B = 1/2$ Slope
$C/B = 6$ y-int
$C/A = -12$ x-int

Slope-Int

$-x = 12 - 2y$

$2y = x + 12$

$\boxed{y = 1/2x + 6}$

$m = 1/2$
$b = 6$
$-b/m = -12$

$\boxed{\begin{matrix} 1/2 \\ (0,6) \\ (-12,0) \end{matrix}}$

8.4

Answer Key

① $y - 2 = -4(x - 3)$

② $y - 3 = 2(x + 1)$

③ $y + 5 = \frac{2}{3}(x - 2)$

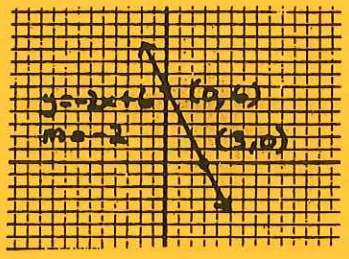
④ $y + 4 = \frac{-1}{2}(x - \frac{1}{2})$

⑤ $y + 8 = 7(x + 3)$ or
$y - 6 = 7(x + 1)$

⑥ $y - 9 = 5(x - 4)$ or
$y + 1 = 5(x - 2)$

⑦ $2x = 6 - y$

$\boxed{y = -2x + 6}$

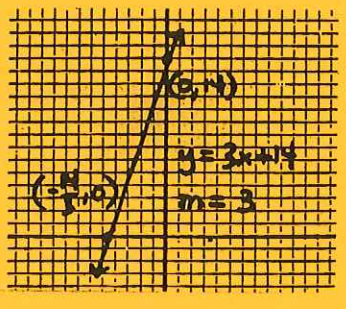


$\boxed{\begin{matrix} m = -2 \\ b = (0,6) \\ \frac{-b}{m} = (3,0) \end{matrix}}$

⑧ $y - 2 = 3(x + 4)$

$y - 2 = 3x + 12$

$\boxed{y = 3x + 14}$



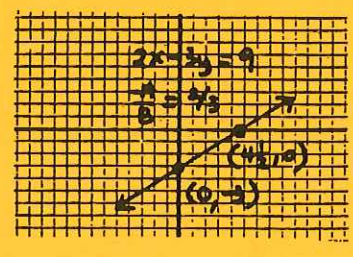
$\boxed{\begin{matrix} m = 3 \\ b = (0,14) \\ \frac{-b}{m} = (\frac{-14}{3}, 0) \end{matrix}}$

⑨ $y = \frac{2}{3}x - 3$

$3y = 2x - 9$

$-2x + 3y = -9$

$\boxed{2x - 3y = 9}$



$\boxed{\begin{matrix} \frac{-A}{B} = 2/3 \\ \frac{C}{B} = (0,-3) \\ \frac{C}{A} = (\frac{9}{2}, 0) \end{matrix}}$

8.5
Answer Key

① $\frac{\text{rise}}{\text{run}} = \frac{2}{1}$

$y = 2x + b$

$(-5) = 2(-3) + b$

$-5 = -6 + b$

$1 = b$

$\boxed{y = 2x + 1}$

② $\frac{\text{rise}}{\text{run}} = \frac{4}{1}$

$y = 4x + b$

$(-3) = 4(-2) + b$

$-3 = -8 + b$

$5 = b$

$\boxed{y = 4x + 5}$

③ $\frac{\text{rise}}{\text{run}} = \frac{8}{2} = 4$

$y = 4x + b$

$(-13) = 4(-4) + b$

$-13 = -16 + b$

$3 = b$

$\boxed{y = 4x + 3}$

④ $\frac{\text{rise}}{\text{run}} = \frac{12}{2} = 6$

$y = 6x + b$

$(5) = 6(1) + b$

$5 = 6 + b$

$-1 = b$

$\boxed{y = 6x - 1}$

⑩ $y + \frac{5}{2} = \frac{1}{2}(x - 2)$

$y + \frac{5}{2} = \frac{1}{2}x - 1$

$2y + 5 = x - 2$

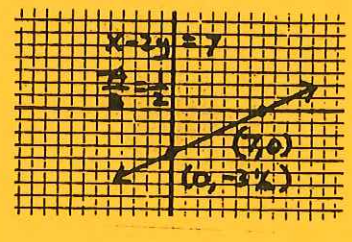
$-x + 2y = -7$

$\boxed{x - 2y = 7}$

$\frac{-A}{B} = \frac{1}{2}$

$\frac{C}{B} = (0, \frac{-7}{2})$

$\frac{C}{A} = (7, 0)$



⑪ $y - 3 = 2(x - 4)$

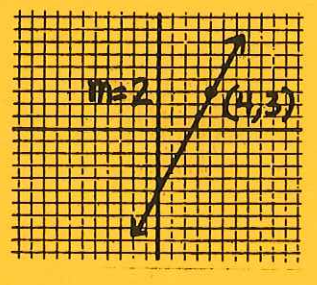
$y - 3 = 2x - 8$

$\boxed{y = 2x - 5}$

$m = 2$

$b = (0, -5)$

$\frac{-b}{m} = (\frac{5}{2}, 0)$



⑫ $y + 6 = -3(x + 2)$

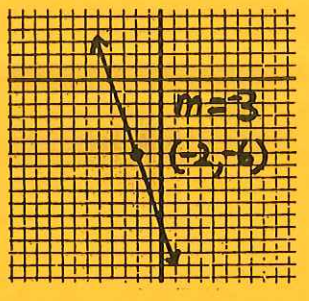
$y + 6 = -3x - 6$

$\boxed{y = -3x - 12}$

$m = -3$

$b = (0, -12)$

$\frac{-b}{m} = (-4, 0)$



⑬ IV

⑭ II

⑮ It is a function

Domain: $\{-2, -3, -4\}$

Range: $\{0, 1\}$

⑯ $y = 0$ yes

⑰ $2x - 3xy = 4$ no

⑱ $(7, -2)\ (9, -2)$

$\frac{(-2) - (-2)}{(7) - (9)} = \frac{0}{-2} = \boxed{0}$

⑲ $(6, -3)\ (6, -8)$

$\frac{(-3) - (-8)}{(6) - (6)} = \frac{5}{0}$ $\boxed{\text{undef.}}$

⑳ $g(x) = 2x - x^2$

$g(n+2) = 2(n+2) - (n+2)^2$

$2n + 4 - (n^2 + 4n + 4)$

$2n + 4 - n^2 - 4n - 4$

$-n^2 - 2n$

$f(x) = -2x$

$f(-n^2 - 2n) = -2(2n^2 + 4n)$

$\boxed{2n^2 + 4n}$

⑤ $\frac{\text{rise}}{\text{run}} = \frac{4}{1}$

$y = 4x + b$

$(4) = 4(1) + b$

$4 = 4 + b$

$0 = b$

$\boxed{y = 4x}$

⑥ $\frac{\text{rise}}{\text{run}} = \frac{-3}{1}$

$y = -3x + b$

$(-3) = -3(1) + b$

$-3 = -3 + b$

$0 = b$

$\boxed{y = -3x}$

⑦ $\frac{\text{rise}}{\text{run}} = \frac{-10}{2} = -5$

$y = -5x + b$

$(28) = -5(-5) + b$

$28 = 25 + b$

$3 = b$

$\boxed{y = -5x + 3}$

⑧ $\frac{\text{rise}}{\text{run}} = \frac{-4}{2} = -2$

$y = -2x + b$

$(26) = -2(-4) + b$

$26 = 8 + b$

$18 = b$

$\boxed{y = -2x + 18}$

⑨ $(-6, -3)$ $m = -\frac{1}{2}$

$y = -\frac{1}{2}x + b$

$(-3) = -\frac{1}{2}(-6) + b$

$-3 = 3 + b$

$-6 = b$

$\boxed{y = -\frac{1}{2}x - 6}$

$\frac{-A}{B} = \frac{-1}{2}$ $A = 1$ $B = 2$

$x + 2y = C$

$(-6) + 2(-3) = C$

$(-6) + (-6) = C$

$-12 = C$

$\boxed{x + 2y = -12}$

⑩ $(9, 1)$ $m = \frac{2}{3}$

$y = \frac{2}{3}x + b$

$(1) = \frac{2}{3}(9) + b$

$1 = 6 + b$

$-5 = b$

$\boxed{y = \frac{2}{3}x - 5}$

$\frac{A}{B} = \frac{2}{3}$ $A = 2$ $B = -3$

$2x - 3y = C$

$2(9) - 3(1) = C$

$18 - 3 = C$

$15 = C$

$\boxed{2x - 3y = 15}$

⑪ $(5, 7)$ $m = 0$

horizontal

$\boxed{y = 7}$

$\boxed{y = 7}$

⑫ $(-2, 3)$ $m =$ undef.

vertical

no slope-int form

$\boxed{x = -2}$

⑬ $(9, 1)$ $(8, 2)$

$\frac{(1) - (2)}{(9) - (8)} = -1$

$y = -x + b$

$(1) = -(9) + b$

$10 = b$

$\boxed{y = -x + 10}$

$\frac{-A}{B} = \frac{-1}{1}$ $A = 1$ $B = 1$

$x + y = C$

$(9) + (1) = C$

$10 = C$

$\boxed{x + y = 10}$

⑭ $(6, -1)$ $(4, -2)$

$\frac{(-1) - (-2)}{(6) - (4)} = \frac{1}{2}$

$y = \frac{1}{2}x + b$

$(-1) = \frac{1}{2}(6) + b$

$-1 = 3 + b$

$-4 = b$

$\boxed{y = \frac{1}{2}x - 4}$

$\frac{A}{-B} = \frac{1}{2}$ $A = 1$ $B = -2$

$x - 2y = C$

$(6) - 2(-1) = C$

$6 + 2 = C$

$8 = C$

$\boxed{x - 2y = 8}$

8.6
Answer Key

⑮ $(-5,1)\ (-7,9)$

$\frac{(1)-(9)}{(-5)-(-7)} = \frac{-8}{2} = -4$ $\quad \frac{-A}{B} = \frac{-4}{1}$ $A=4$ $B=1$

$y = -4x+b$
$(1) = -4(-5)+b$
$1 = 20+b$
$-19 = b$

$\boxed{y = -4x-19}$

$4x+y=C$
$4(-5)+(1)=C$
$-20+1=C$
$-19=C$

$\boxed{4x+y=-19}$

⑯ $(6,2)\ (3,3)$

$\frac{(2)-(3)}{(6)-(3)} = \frac{-1}{3}$ $\quad \frac{-A}{B} = \frac{-1}{3}$ $A=1$ $B=3$

$y = -\frac{1}{3}x+b$
$(2) = -\frac{1}{3}(6)+b$
$2 = -2+b$
$4 = b$

$\boxed{y = -\frac{1}{3}x+4}$

$x+3y=C$
$(6)+3(2)=C$
$6+6=C$
$12=C$

$\boxed{x+3y=12}$

⑰ $(-4,-3)\ (-7,3)$

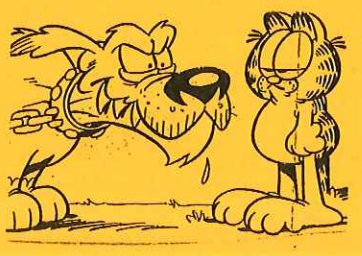
$\frac{(-3)-(3)}{(-4)-(-7)} = \frac{-6}{3} = -2$

$\boxed{y+3 = -2(x+4) \text{ or } y-3 = -2(x+7)}$

⑱ $(-2,4)\ (-5,5)$

$\frac{(4)-(5)}{(-2)-(-5)} = \frac{-1}{3}$

$\boxed{y-4 = -\frac{1}{3}(x+2) \text{ or } y-5 = -\frac{1}{3}(x+5)}$



① slope $-\frac{3}{3}, -\frac{2}{3}$ parallel

② slope $\frac{1}{2}, -2$ perpendicular

③ slope $3, \frac{1}{3}$ neither

④ slope $\frac{4}{3}, -\frac{3}{4}$ perpendicular

⑤ slope $-3, \frac{1}{3}$ perpendicular

⑥ slope undef, 0 perpendicular

⑦ slope $\frac{1}{4}, \frac{1}{4}$ parallel

⑧ slope $2, -\frac{1}{2}$ perpendicular

⑨ slope $\frac{3}{3}, -\frac{3}{2}$ perpendicular

⑩ slope $2, 2$ parallel

⑪ $6x+y=4$ slope $=-6$
$6(-2)+(3)=C$ $\quad C=-9$
$\boxed{6x+y=-9}$

⑫ $5x-2y=7$ slope $=\frac{5}{2}$
$5(0)-2(-4)=C$ $\quad C=8$
$\boxed{5x-2y=8}$

⑬ $y=-\frac{3}{5}x+4$ slope $=-\frac{3}{5}$
$(-1)=-\frac{3}{5}(0)+b$ $\quad b=-1$
$\boxed{y=-\frac{3}{5}x-1}$

⑭ $y=\frac{3}{4}x-1$ slope $=\frac{3}{4}$
$(0)=\frac{3}{4}(0)+b$ $\quad b=0$
$\boxed{y=\frac{3}{4}x}$

⑮ $5x-3y=7$ $\quad \perp$ slope $=-\frac{3}{5}$
$\frac{-A}{B} = \frac{-3}{5}$ $\quad A=3$ $\quad B=5$
$3x+5y=C$
$3(8)+5(-2)=C$ $\quad C=14$ $\quad \boxed{3x+5y=14}$

(16) $3x+8y=4$ $\perp$ slope $=8/3$

$\frac{A}{-B}=\frac{8}{3}$ $A=8$ $B=-3$

$8x-3y=C$

$8(0)-3(4)=C$ $C=-12$

$\boxed{8x-3y=-12}$

(17) $y=3x-2$ $\perp$ slope $=-1/3$

$y=-1/3\,x+b$

$(-1)=-1/3(6)+b$ $b=1$

$\boxed{y=-1/3x+1}$

(18) $y=-3x+7$ $\perp$ slope $=1/3$

$y=1/3x+b$

$(1)=1/3(-3)+b$ $b=2$

$\boxed{y=1/3x+2}$

(19) $y-2=\frac{2}{3}(x-3)$ $\parallel$ slope $=\frac{2}{3}$

$\boxed{y+2=2/3(x-5)}$

(20) $y+3=-2(x+\frac{1}{2})$ $\parallel$ slope $=-2$

$\boxed{y+1=-2(x+1)}$

(21) $y-4=\frac{1}{2}(x+1)$ $\perp$ slope $=-2$

$\boxed{y+2=-2(x-4)}$

(22) $y+3=-4(x-1)$ $\perp$ slope $=1/4$

$\boxed{y-3=1/4(x-3)}$

(23) $3x-6y=2$ slope $=1/2$

$y=1/2x+b$

$(2)=\frac{1}{2}(1)+b$ $b=3/2$

$\boxed{y=1/2\,x+3/2}$

(24) $2x+y=5$ $\perp$ slope $=1/2$

$y=1/2\,x+b$

$(-3)=1/2(-1)+b$ $b=-5/2$

$\boxed{y=1/2x-5/2}$

(25) $y=5x-3$ $\perp$ slope $=-1/5$

$\frac{-A}{B}=\frac{-1}{5}$ $A=1$ $B=5$

$x+5y=C$

$(0)+5(-1)=C$ $C=-5$

$\boxed{x+5y=-5}$

(26) $y=x$ slope $=1$

$\frac{A}{-B}=\frac{1}{1}$ $A=1$ $B=-1$

$x-y=C$

$(7)-(-2)=C$ $C=9$

$\boxed{x-y=9}$

(27) $y=4$

horizontal

$\boxed{y=-5}$

(29) $y=5$

horizontal

$\boxed{x=0}$

(28) $x=-2$

vertical

$\boxed{y=7}$

(30) $x=-1$

vertical

$\boxed{x=-3}$

8.7

Answer Key

(1) $(3,5)$ $(11,7)$

$\frac{3+11}{2}, \frac{5+7}{2}$

$\boxed{(7,6)}$

(2) $(5,9)$ $(-7,3)$

$\frac{5+(-7)}{2}, \frac{9+3}{2}$

$\boxed{(-1,6)}$

③ (6,-7) (4,-11)

$\frac{6+4}{2}, \frac{(-7)+(-11)}{2}$

$\boxed{(5,-9)}$

④ (4,-7) (-8,1)

$\frac{4+(-8)}{2}, \frac{(-7)+1}{2}$

$\boxed{(-2,-3)}$

⑤ (3,5) (5,-7)

3 → 5 add 2

5 → -7 sub 12

5+2, -7-12

$\boxed{(7,-19)}$

⑥ (7,4) (9,-3)

7 → 9 add 2

4 → -3 sub 7

9+2, -3-7

$\boxed{(11,-10)}$

⑦ (5,7) (5,6)

5 → 5 add 0

7 → 6 sub 1

5+0, 6-1

$\boxed{(5,5)}$

⑧ (3,-5) (-3,8)

3 → -3 sub 6

-5 → 8 add 13

-3-6, 8+13

$\boxed{(-9,21)}$

⑨ $3x-y=4$ slope = 3

$y=3x+b$

$(-4)=3(2)+b \quad b=-10$

$\boxed{y=3x-10}$

⑩ $y=2x+1$ ⊥ slope $=-\frac{1}{2}$

$\frac{-A}{B}=\frac{-1}{2} \quad A=1 \quad B=2$

$x+2y=C$

$(4)+2(3)=C \quad C=10$

$\boxed{x+2y=10}$

⑪ $2x-y=5$ ⊥ slope $=-\frac{1}{2}$

$\boxed{y-2=-\frac{1}{2}(x+1)}$

⑫ $y=2$

horizontal

$\boxed{y=-1}$

⑬ $\frac{\text{rise}}{\text{run}} \quad \frac{6}{-3}=-2$

$y=-2x+b$

$(2)=-2(-4)+b$

$2=8+b \quad b=-6$

$\boxed{y=-2x+6}$

⑭ (-2,3) (-5,12)

$\frac{(3)-(12)}{(-2)-(-5)}=\frac{-9}{3}=-3$

$\frac{-A}{B}=\frac{-3}{1} \quad A=3 \quad B=1$

$3x+y=C$

$3(-2)+(3)=C$

$C=-3$

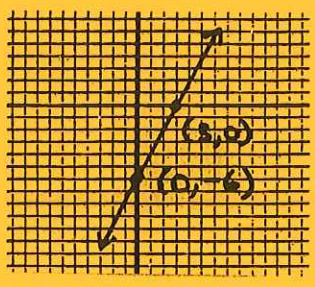
$\boxed{3x+y=-3}$

⑮ $\boxed{y-5=-\frac{1}{2}(x+1)}$

⑯ $2x-y=6$

y-int $\frac{C}{B}$ (0,-6)

x-int $\frac{C}{A}$ (3,0)



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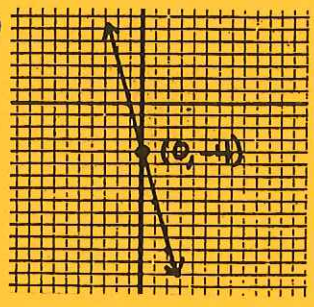


Unit 8
REVIEW
Answer Key

① II

② IV

③ {(-2,-3) (3,-1) (4,0) (4,5)}

domain

{-2, 3, 4}

range

{-3, -1, 0, 5}

④ no

⑤ yes

⑥ yes

⑦ no

⑧ yes

⑨ $f(x)=2x^2-3x$

$f(-2)=2(-2)^2-3(-2)$

$2(4)-(-6)$

$\boxed{14}$

⑩ $g(x)=2x-3$

$g(n+2)=2(n+2)-3$

$2n+4-3$

$2n+1$

$f(x)=3x-x^2$

$f(2n+1)=3(2n+1)-(2n+1)^2$

$(6n+3)-(4n^2+4n+1)$

$6n+3-4n^2-4n-1$

$\boxed{-4n^2+2n+2}$

⑪ $\frac{-6}{2}=\boxed{-3}$

⑫ $\boxed{0}$

⑬ $\frac{3}{9}=\boxed{\frac{1}{3}}$

⑭ $\boxed{\text{undefined}}$

⑮ $(-6,3)\ (-6,5)$

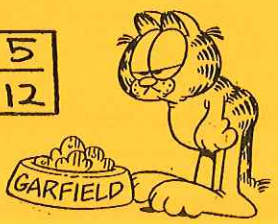
$\frac{(3)-(5)}{(-6)-(-6)}=\frac{-2}{0}$

$\boxed{\text{undefined}}$

⑯ $(-2,-9)\ (10,-4)$

$\frac{(-9)-(-4)}{(-2)-(10)}=\frac{-5}{-12}$

$\boxed{\frac{5}{12}}$



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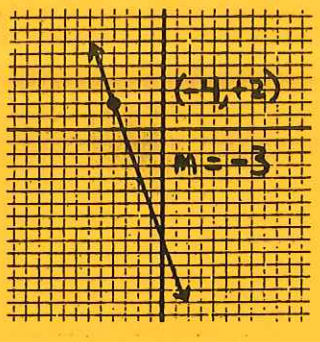

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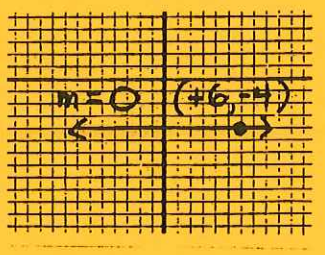


⑲ $3x=12+6y$

$-6y=-3x+12$

$y=\frac{1}{2}x-2$	
slope (m)	$\frac{1}{2}$
y-int (b)	$(0,-2)$
x-int $(\frac{-b}{m})$	$(4,0)$

⑳ $4x-2y=6$

$-2y=-4x+6$

$y=2x-3$	
slope (m)	2
y-int (b)	$(0,-3)$
x-int $(\frac{-b}{m})$	$(\frac{3}{2},0)$

㉑ $y=\frac{3}{4}x-2$

$4y=3x-8$

$-3x+4y=-8$

$3x-4y=8$	
slope $(\frac{A}{B})$	$\frac{3}{4}$
y-int $(\frac{C}{B})$	$(0,-2)$
x-int $(\frac{C}{A})$	$(\frac{8}{3},0)$

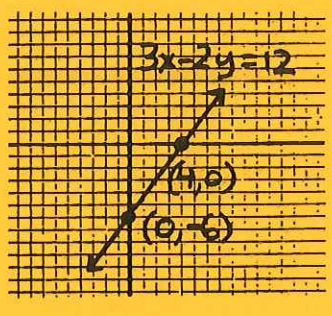
㉒ $6y-8=12x+10$

$-12x+6y=18$

$12x-6y=-18$

$2x-y=-3$	
slope $(\frac{-A}{B})$	2
y-int $(\frac{C}{B})$	$(0,3)$
x-int $(\frac{C}{A})$	$(\frac{3}{2},0)$

㉓



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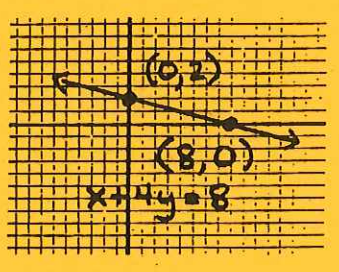

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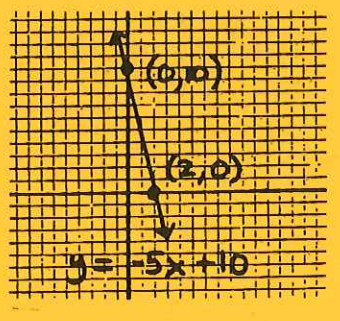

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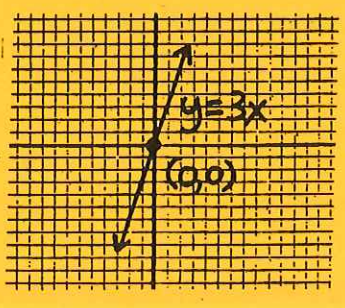
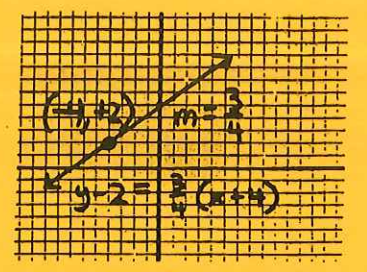
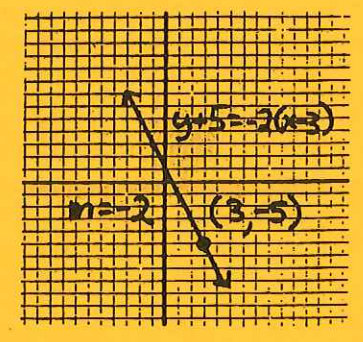


(27) 

(28) 

(29) $\frac{\text{rise}}{\text{run}} = \frac{6}{-4} = \frac{-3}{2}$

$y = \frac{-3}{2}x + b$

$(-8) = \frac{-3}{2}(-2) + b$

$-8 = 3 + b$

$-11 = b$

$\boxed{y = \frac{-3}{2}x - 11}$

(30) $\frac{\text{rise}}{\text{run}} = \frac{8}{2} = 4$

$y = 4x + b$

$(-12) = 4(-3) + b$

$-12 = -12 + b$

$0 = b$

$\boxed{y = 4x}$

(31) $y = -2x + b$

$(3) = -2(-6) + b$

$3 = 12 + b$

$-9 = b$

$\boxed{y = -2x - 9}$

(32) $(-8,4)(0,4)$

$\frac{(4)-(4)}{(-8)-(0)} = \frac{0}{-8} = 0$

$y = 0x + b$

$y = b$ $\boxed{y = 4}$

(33) $\frac{A}{-B} = \frac{4}{1}$ $A = 4$ $B = -1$

$4x - y = C$

$4(-9) - (-3) = C$

$-36 + 3 = C$

$-33 = C$

$\boxed{4x - y = -33}$

(34) $(6,-10)(8,-6)$

$\frac{(-10)-(-6)}{(6)-(8)} = \frac{-4}{-2} = 2$

$\frac{A}{-B} = \frac{2}{1}$ $A = 2$ $B = -1$

$2x - y = C$

$2(6) - (-10) = C$

$12 + 10 = C$

$22 = C$

$\boxed{2x - y = 22}$

(35) $(-3,-5)$ $m = \frac{-2}{3}$

$\boxed{y + 5 = \frac{-2}{3}(x + 3)}$

(36) $(4,-5)(8,-13)$

$\frac{(-5)-(-13)}{(4)-(8)} = \frac{8}{-4} = -2$

$\boxed{y + 5 = -2(x - 4) \text{ or } y + 13 = -2(x - 8)}$

(37) slope $\frac{3}{5}, \frac{-3}{5}$ $\boxed{\text{neither}}$

(38) slope $-4, \frac{1}{4}$

$\boxed{\text{perpendicular}}$

(39) $3x - 2y = 4$

$3(-6) - 2(2) = C$

$-18 - 4 = C$

$-22 = C$

$\boxed{3x - 2y = -22}$

(40) $y = \frac{-2}{3}x + 1$

$\perp$ slope $= 3/2$

$y = \frac{3}{2}x + b$

$(-4) = \frac{3}{2}(6) + b$

$-4 = 9 + b$

$-13 = b$

$\boxed{y = \frac{3}{2}x - 13}$

(41) $2x - 3y = 7$

slope $= \frac{2}{3}$

$\perp$ slope $= \frac{-3}{2}$

$y = \frac{-3}{2}x + b$

$(-3) = \frac{-3}{2}(4) + b$

$-3 = -6 + b$

$3 = b$

$\boxed{y = \frac{-3}{2}x + 3}$

(42) $y = \frac{-1}{2}x + 8$

slope $= \frac{-1}{2}$

$\frac{-A}{B} = \frac{-1}{2}$ $A = 1$ $B = 2$

$x + 2y = C$

$(6) + 2(-2) = C$

$6 + (-4) = C$

$2 = C$

$\boxed{x + 2y = 2}$

(43) $y=-4$ horizontal through $(-1,2)$ (all y-coordinates are the same on a horizontal line)

$\boxed{y=2}$

(44) $x=4$ vertical ⊥ through $(5,7)$ all y-coordinates 7

$\boxed{y=7}$

(45) $(-6,11)(-12,15)$

$\frac{(-6)+(-12)}{2}, \frac{11+15}{2}$

$\boxed{(-9,13)}$

(46) $A(-2,7)$ $P(-5,9)$

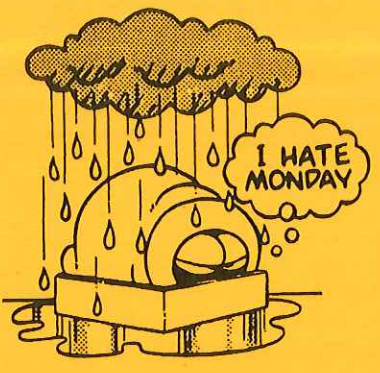
$-2 \to -5$ sub 3

$7 \to 9$ add 2

$-5-3, 9+2$

$\boxed{(-8,11)}$

end point



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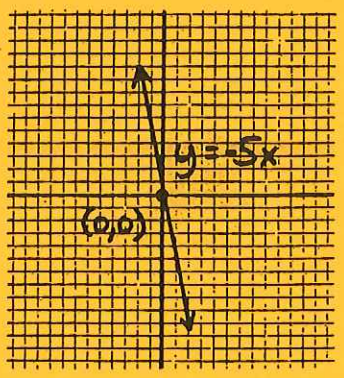

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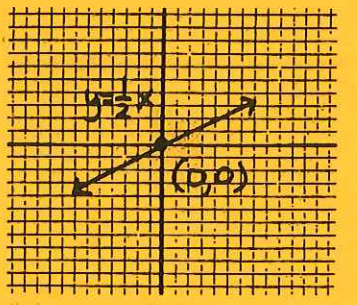


Unit 8
SKILL CHECK - ANSWER KEY

(1) III

(2) no

(3) yes

(4) $f(x)=2x^3-x^2$

$f(-2)=2(-2)^3-(-2)^2$

$2(-8)-(4)$

$(-16)+(-4)$

$\boxed{-20}$

(5) $\frac{\text{rise}}{\text{run}}=\frac{6}{2}=\boxed{3}$

(6) $(-4,2)(-4,9)$

$\frac{(2)-(9)}{(-4)-(-4)}=\frac{-7}{0}$

$\boxed{\text{undefined}}$

(7) $2x-4y=8$

$-4y=-2x+8$

$y=\frac{1}{2}x-2$

slope (m)	$\frac{1}{2}$
y-int (b)	$(0,-2)$
x int $(-\frac{b}{m})$	$(4,0)$

(8) $4y=\frac{4}{5}x-2$

$12y=4x-6$

$-4x+12y=-6$

$4x-12y=6$

$2x-6y=3$

slope $(-\frac{A}{B})$	$\frac{1}{3}$
y-int $(\frac{C}{B})$	$(0,-\frac{1}{2})$
x-int $(\frac{C}{A})$	$(\frac{3}{2},0)$

(9) $\frac{\text{rise}}{\text{run}}=\frac{6}{-3}=-2$

$y=-2x+b$

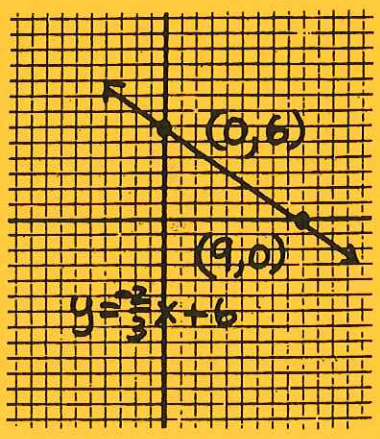
$(-4)=-2(-7)+b$

$-4=14+b$

$-18=b$

$\boxed{y=-2x-18}$

(10)



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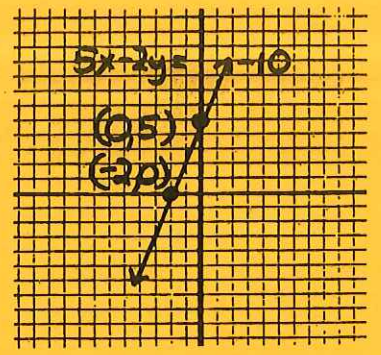

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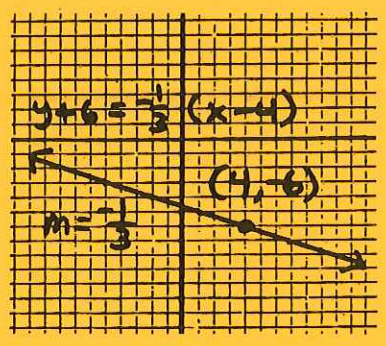

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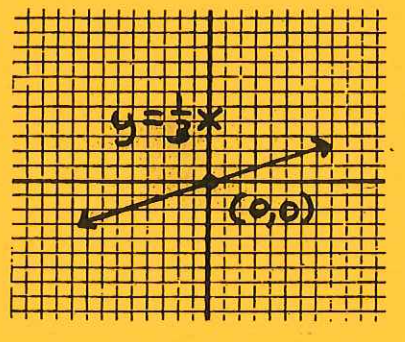


⑭ (4,-3) (5,-7)

$\frac{(-3)-(-7)}{(4)-(5)} = \frac{4}{-1}$ A=4 B=1

$4x+y=C$

$4(4)+(-3)=C$

$13=C$

$\boxed{4x+y=13}$

⑮ (2,-3) (4,-3)

$\frac{(-3)-(-3)}{(2)-(4)} = \frac{0}{-2} = 0$

$\boxed{y=-3}$

⑯ $\boxed{y+5=\frac{-2}{5}(x-2)}$

⑰ $y=\frac{-1}{3}x+5$

$\perp$ slope $=3$

$\frac{A}{-B} = \frac{3}{1}$ A=3 B=-1

$3x-y=C$

$3(-6)-(-3)=C$ C=-21

$\boxed{3x-y=-21}$

⑱ A(4,-7) B(-2,5)

$\frac{4+(-2)}{2}, \frac{-7+5}{2}$

$\boxed{(1,-1)}$ midpoint

⑲ $g(x)=6-x$

$g(3n+2)=6-(3n+2)$

$4-3n$

$f(x)=2x-3x^2$

$f(4-3n)=2(4-3n)-3(4-3n)^2$

$(8-6n)-3(16-24n+9n^2)$

$8-6n-48+72n-27n^2$

$\boxed{-27n^2+66n-40}$

Unit 8
REMEDIATION - ANSWER KEY

① I

② yes

③ no

④ $f(x)=3x^2-x^3$

$f(-3)=3(-3)^2-(-3)^3$

$3(9)-(-27)$

$\boxed{54}$

⑤ $\boxed{\text{undefined}}$

⑥ (5,-2) (-7,-5)

$\frac{(-2)-(-5)}{(5)-(-7)} = \frac{3}{12} = \boxed{\frac{1}{4}}$

⑦ $x+3y=-9$

$3y=-x-9$

$\boxed{y=\frac{-1}{3}x-3}$

slope (m) $-1/3$

y-int (b) $(0,-3)$

x-int $(-b/m)$ $(-9,0)$

⑧ $6y=\frac{-3}{4}x+9$

$24y=-3x+36$

$3x+24y=36$

$\boxed{x+8y=12}$

slope $(-\frac{A}{B})$ $-1/8$

y-int (C/B) $(0,3/2)$

x-int (C/A) $(12,0)$

⑨ $\frac{\text{rise}}{\text{run}} = \frac{-10}{5} = -2$

continued →

$y=-2x+b$

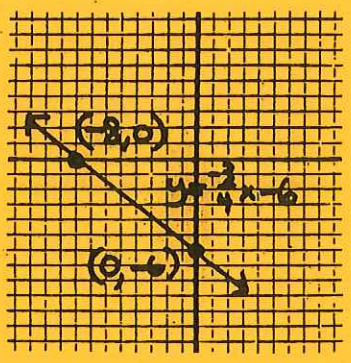
$(7)=-2(4)+b$

$7=-8+b$

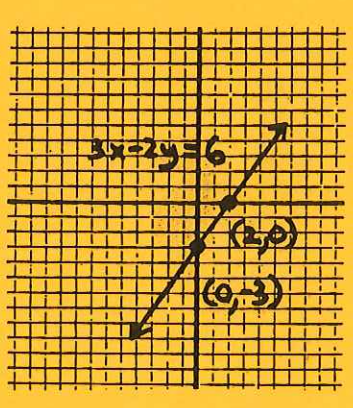
$15=b$

$\boxed{y=-2x+15}$

⑩



⑪



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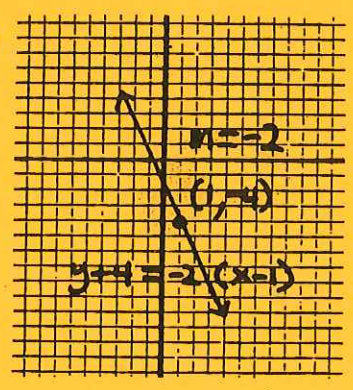

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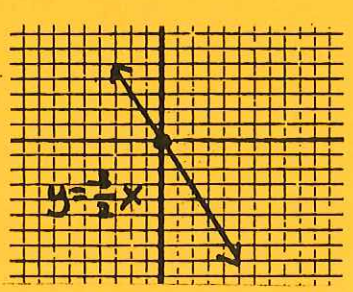


⑭ $(4,-1)(6,-13)$

$\frac{(-1)-(-13)}{(4)-(6)}=\frac{12}{-2}=-6$

$\frac{-6}{1}=\frac{-A}{B}$ $A=6$ $B=1$

$6x+y=C$

$6(4)+(-1)=C$

$23=C$

$\boxed{6x+y=23}$

⑮ $(7,-1)(7,0)$

$\frac{(1)-(0)}{(7)-(7)}=\frac{-1}{0}$

undefined

$\boxed{x=7}$

⑯ $\boxed{y+6=-\frac{1}{2}(x-2)}$

⑰ $y=-3x+6$

$\perp$ slope $=1/3$

$\frac{A}{-B}=\frac{1}{3}$ $A=1$ $B=-3$

$x-3y=C$

$(12)-3(12)=C$

$-24=C$

$\boxed{x-3y=-24}$

⑱ $A(-1,7)$

$B(-5,21)$

$\frac{(-1)+(-5)}{2}, \frac{7+21}{2}$

$\frac{-6}{2}, \frac{28}{2}$

$\boxed{(-3,14)}$

⑲ $g(x)=2x+2$

$g(2a-3)=2(2a-3)+2$

$4a-6+2$

$4a-4$

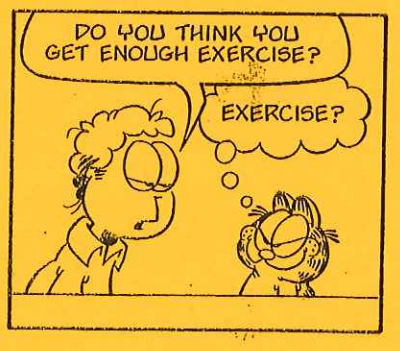
$f(x)=5x-2x^2$

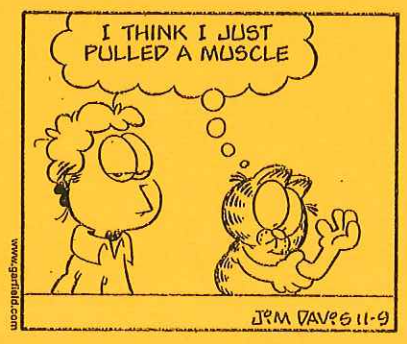
$f(4a-4)=5(4a-4)-2(4a-4)^2$

$(20a-20)-2(16a^2-32a+16)$

$20a-20-32a^2+64a-32$

$\boxed{-32a^2+84a-52}$





Unit 8

EXTRA PRACTICE - KEY

Answer Key (AB)

① A. III
B. IV

② A. yes
B. no

③ A. yes
B. yes

④ A. -6
B. 28

⑤ A. 9/2
B. -1

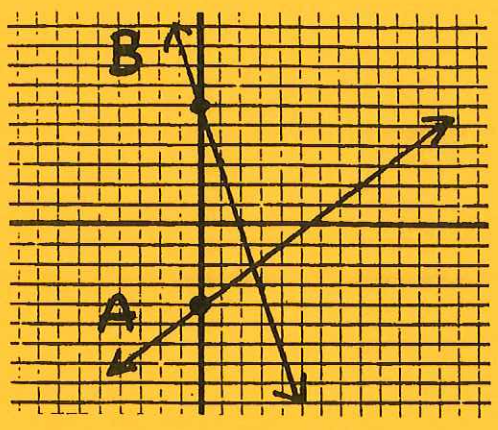
⑥ A. -2
B. 0

⑦ A. $y = -4x + 3$
y-int (0,3)
x-int (3/4, 0)
$m = -4$
B. $y = -1/2 x + 3$
y-int (0,3)
x-int (6,0)
$m = -1/2$

⑧ A. $x - 6y = -9$
y-int (0, 3/2)
x-int (-9, 0)
$-A/B = 1/6$
B. $3x + y = 9$
y-int (0,9)
x-int (3,0)
$-A/B = -3$

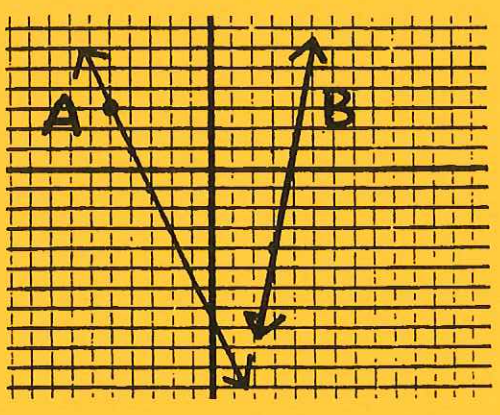
⑨ A. $y = -2/3 x + 8/3$
B. $y = -2/7 x - 17/7$

⑩

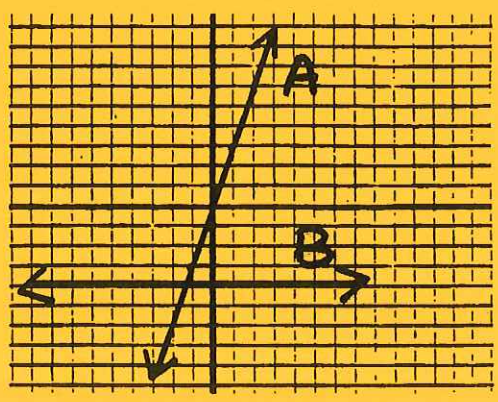


⑪

⑫



⑬



⑭ A. $9x - y = -22$
B. $x + 2y = 9$

⑮ A. $x = -5$
B. $y = 7$

⑯ A. $y + 5 = 2/3 (x - 4)$
B. $y + 6 = -5 (x + 3)$

⑰ A. $x + 2y = 2$
B. $x + 3y = -1$

⑱ A. (-5, 8)
B. (-16, 22)

⑲ A. $-18n^2 - 45n - 28$
B. $2n^2 - 8n + 3$

⑳ A. $y - 7 = \frac{-10}{9}(x + 4)$
-or-
$y + 3 = \frac{-10}{9}(x - 5)$
B. $y = 3/10 (x + 4)$
-or-
$y - 3 = 3/10 (x - 6)$

Unit 8

EXTRA PRACTICE - KEY

Answer Key (CD)

① C. II
D. I

② C. yes
D. no

③ C. yes
D. no

④ C. 32
D. 4

⑤ C. undefined
D. 1/3

⑥ C. $-1/2$
D. undefined

⑦ C. $y = 2x - 4$
y-int $(0,-4)$
x-int $(2,0)$
$m = 2$

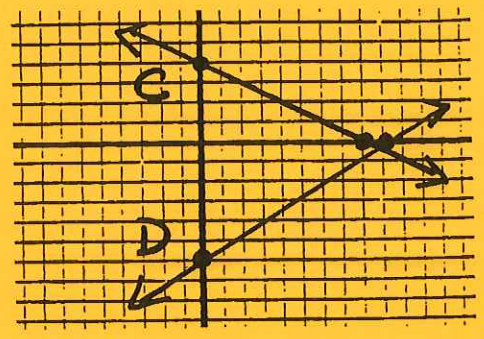
D. $y = 1/3x + 3$
y-int $(0,3)$
x-int $(-9,0)$
$m = 1/3$

⑧ C. $2x - y = -3$
y-int $(0,3)$
x-int $(-3/2,0)$
$-A/B = 2$

D. $4x - 8y = 1$
y-int $(0,-1/8)$
x-int $(1/4,0)$
$-A/B = 1/2$

⑨ C. $y = -1/3x + 32/3$
D. $y = 3/4x + 11$

⑩



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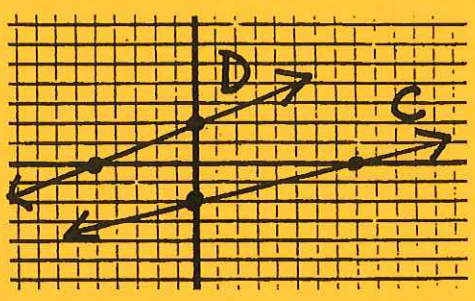

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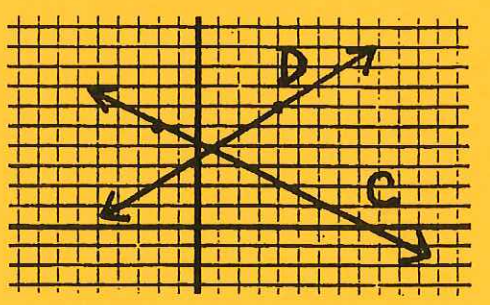
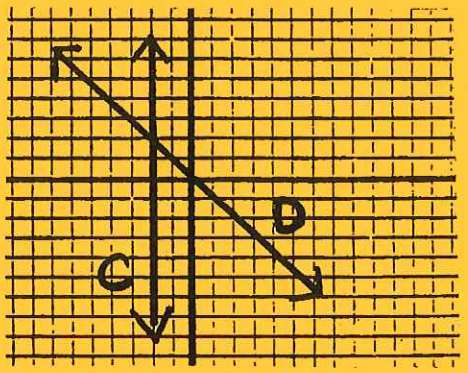


⑬



⑭ C. $3x + 2y = 2$
D. $x + 3y = 0$

⑮ C. $y = 3$
D. $y = -1$

⑯ C. $y - 7 = 1/4(x + 4)$
D. $y - 2 = 3(x + 3)$

⑰ C. $x + 5y = 25$
D. $3x - y = 2$

⑱ C. $(-3/2, 4)$
D. $(11, -3)$

⑲ C. $16n^2 + 36n + 18$
D. $4n^2 - 28n + 48$

⑳ C. $y + 6 = x + 2$
-or-
$y - 1 = x - 5$

D. $y - 4 = -12/5(x + 2)$
-or-
$y + 8 = -12/5(x - 3)$

9.1
Answer Key

① $3x+y=6$ $m=-3$
$x-y=2$ $m=1$

independent, consistent, 1

② $x+2y=5$ $m=-1/2$ $(0,5/2)$
$2x+4y=1$ $m=-1/2$ $(0,1/4)$

independent, inconsistent, 0

③ $2x-3y=-5$ $m=2/3$
$x=2$ $m=$ undefined

independent, consistent, 1

④ $2x+3y=4$ $m=-2/3$ $(0,4/3)$
$4x+6y=8$ $m=-2/3$ $(0,4/3)$

dependent, consistent, inf

⑤ $x+2y=6$ $m=-1/2$
$y=-\frac{1}{2}x+3$ $m=-1/2$

dependent, consistent, inf

⑥ $x+y=6$ $m=-1$
$x-y=2$ $m=1$

independent, consistent, 1

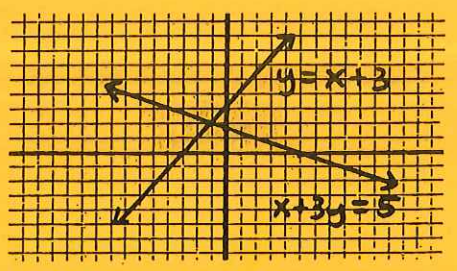
⑦ $9x-4y=2$ $m=9/4$
$y=-x+6$ $m=-1$

independent, consistent, 1

⑧ $y=-1/2x+4$ $m=-1/2$ $(0,4)$
$3x+6y=24$ $m=-1/2$ $(0,4)$

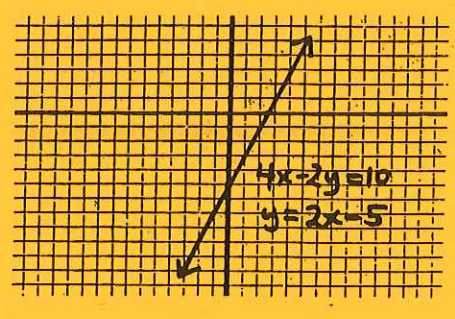
dependent, consistent, inf

⑨



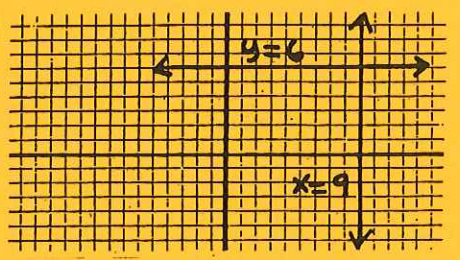
independent, consistent, 1

⑩



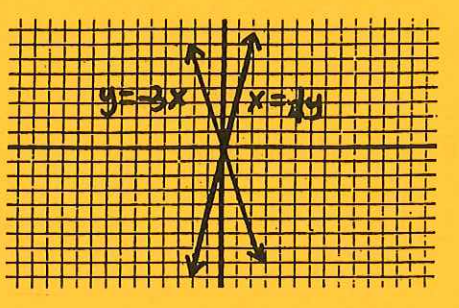
dependent, consistent, inf

⑪



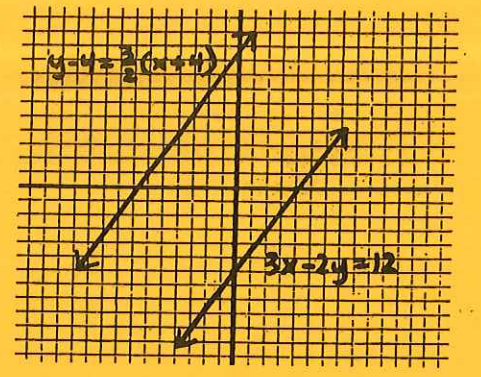
independent, consistent, 1

⑫



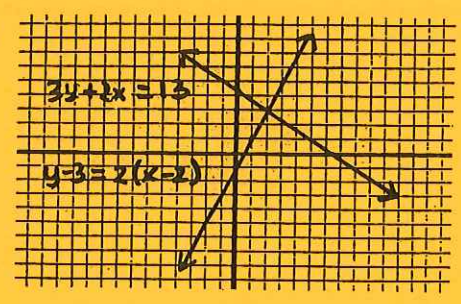
independent, consistent, 1

(13)



independent, inconsistent, 0

(14)



independent, consistent, 1

9.2
Answer Key

(1) $y=3x$

$x+2y=-21$

$x+2(3x)=-21$

$x+6x=-21$

$7x=-21$

$x=-3$

$y=3x$

$y=3(-3)$

$y=-9$

$(-3,-9)$

independent, consistent, 1

(2) $y=2x$

$x+2y=8$

$x+2(2x)=8$

$x+4x=8$

$5x=8$

$x=8/5$

$y=2x$

$y=2(8/5)$

$y=16/5$

$(8/5, 16/5)$

independent, consistent, 1

(3) $3x+y=2$

$y=-3x+2$

$2x-y=1/2$

$2x-(-3x+2)=1/2$

$2x+3x-2=1/2$

$5x=5/2$

$x=1/2$

$y=-3x+2$

$y=-3(1/2)+2$

$y=-3/2+2$

$y=1/2$

$(1/2, 1/2)$

independent, consistent, 1

(4) $3x+y=7$

$y=-3x+7$

$10x-3y=-2$

$10x-3(-3x+7)=-2$

$10x+9x-21=-2$

$19x=19$

$x=1$

$y=-3x+7$

$y=-3(1)+7$

$y=-3+7$

$y=4$

$(1,4)$

independent, consistent, 1

(5) $x+\frac{2}{3}y=4$

$x=-\frac{2}{3}y+4$

$3x+2y=14$

$3(-\frac{2}{3}y+14)+2y=14$

$-2y+12+2y=14$

$12=14$

false equation

no solutions: parallel

independent inconsistent

(6) $x+2y=3$

$x=-2y+3$

$2x+4y=6$

$2(-2y+3)+4y=6$

$-4y+6+4y=6$

$6=6$

identity

inf. solutions: one line

dependent, consistent

⑦ $y-4=3(x+2)$
$y-4=3x+6$
$y=3x+10$

$6x-2y=12$
$6x-2(3x+10)=12$
$6x-6x-20=12$
$-20=12$
False equation

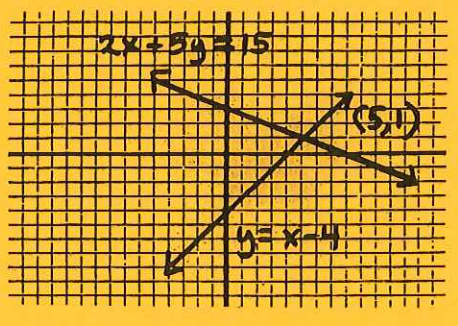
no solutions:
parallel
independent
inconsistent

⑧ $y=-2x+8$

$x+\frac{1}{2}y=4$
$x+\frac{1}{2}(-2x+8)=4$
$x-x+4=4$
$4=4$
identity

inf. solutions:
one line
dependent
consistent

⑨

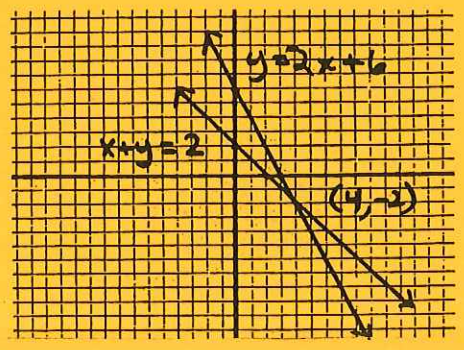


$y=x-4$

$2x+5y=15$
$2x+5(x-4)=15$
$2x+5x-20=15$
$7x-20=15$
$7x=35$
$x=5$

$y=x-4$
$y=(5)-4$
$y=1$
$(5,1)$

⑩



$y=-2x+6$
$x+y=2$
$x+(-2x+6)=2$
$x-2x+6=2$
$-x=-4$
$x=4$

$y=-2x+6$
$y=-2(4)+6$
$y=-8+6$
$y=-2$
$(4,-2)$

9.3 Answer Key

① $x+y=7$
$x-y=9$
$2x=16$
$x=8$

$x+y=7$
$(8)+y=7$
$y=-1$
$(8,-1)$

② $2x-3y=-4$
$x=7-3y$ mult by -2

$2x-3y=-4$
$-2x+6y=-14$
$-9y=-18$
$y=2$

$x=7-3y$
$x=7-3(2)$
$x=1$
$(1,2)$

③ $3x+3y=6$
$2x-y=1$ mult by 3

$3x+3y=6$
$6x-3y=3$
$9x=9$
$x=1$

$2x-y=1$
$2(1)-y=1$
$y=1$
$(1,1)$

④ $x-5y=0$ mult by -2
$2x-3y=7$

$-2x+10y=0$
$2x-3y=7$
$7y=7$
$y=1$

$x-5(1)=0$
$x-5=0$
$x=5$
$(5,1)$

⑤ $5x+3y=10$
$6x-9y=12$

mult by 3

$5x+3y=10$
$5(2)+3y=10$
$3y=0$
$y=0$

$15x+9y=30$
$6x-9y=12$
$21x=42$
$x=2$

$\boxed{(2,0)}$

⑥ $9x+8y=7$
$18x-14=16y$

mult by -2

$9x+8y=7$
$9x+8(0)=7$
$9x=7$
$x=7/9$

$-18x-16y=-14$
$18x-16y=14$
$-32y=0$
$y=0$

$\boxed{(7/9,0)}$

⑦ $\frac{1}{3}x-y=0$
$\frac{1}{5}x+\frac{2}{5}y=1$

mult by 3
mult by -5

$x-3y=0$
$x-3(1)=0$
$x=3$

$x-3y=0$
$-x-2y=-5$
$-5y=-5$
$y=1$

$\boxed{(3,1)}$

⑧ $\frac{1}{8}(x+y)=1$
$x-y=4$

mult by 8

$x-y=4$
$(6)-y=4$
$-y=-2$
$y=2$

$x+y=8$
$x-y=4$
$2x=12$
$x=6$

$\boxed{(6,2)}$

⑨ $x-y=4 \longrightarrow x=4+y$
$2x=3(y+2)$
$2(4+y)=3(y+2)$
$8+2y=3y+6$
$-y=-2$
$y=2$
$x=4+y$
$x=4+(2)$
$x=6$

$\boxed{(6,2)}$

⑩ $x=2y$
$x+18=4y-4$
$(2y)+18=4y-4$
$-2y=-22$
$y=11$

$x=2y$
$x=2(11)$
$x=22$

$\boxed{(22,11)}$

⑪

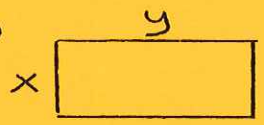
	now	in 10
Layla	x	$x+10$
Diana	y	$y+10$

$x=3y$
$x+10=2(y+10)$
$(3y)+10=2y+20$
$y=10$

$x=3y$
$x=3(10)$
$x=30$

$\boxed{\text{Layla is 30 yrs old}}$

⑫

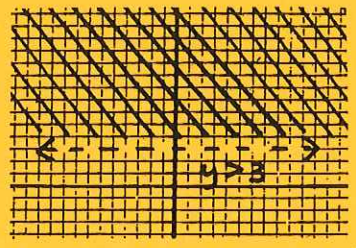


$y=2x-1$
$2x+2y=40$
$2x+2(2x-1)=40$
$2x+4x-2=40$
$6x=42$
$x=7 \quad y=13$

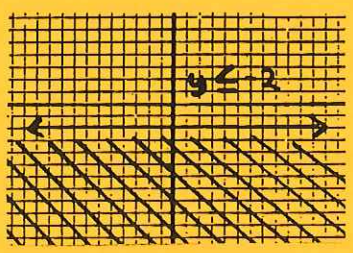
$\boxed{\text{7 by 13 cm}}$

9.4
Answer Key

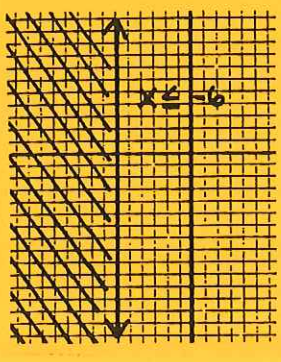
①

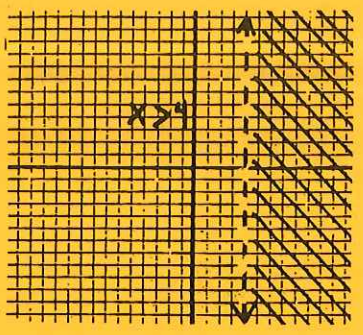


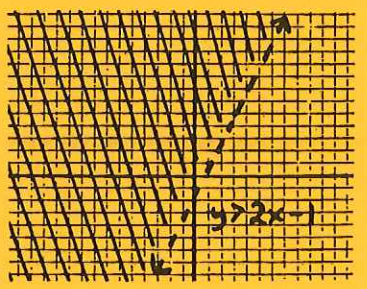
②

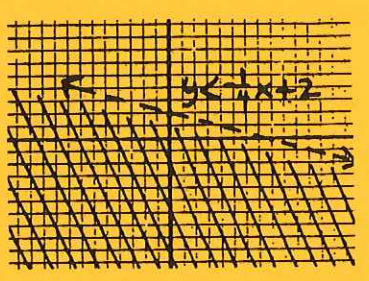


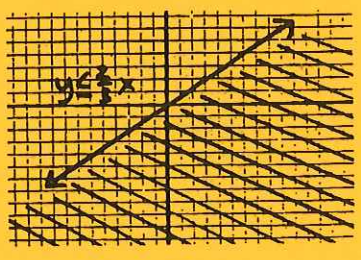
③

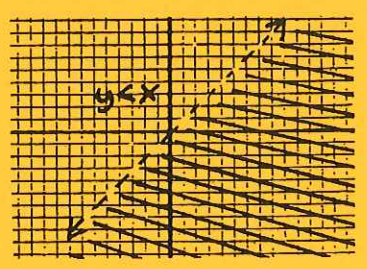


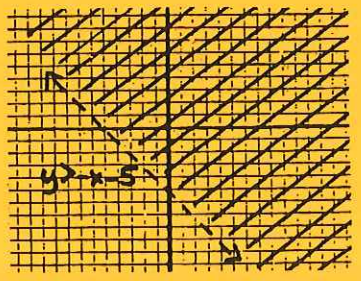
(4) 

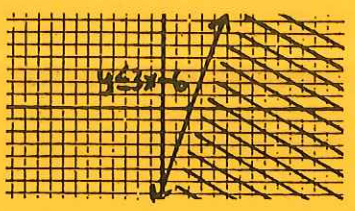
(5) 

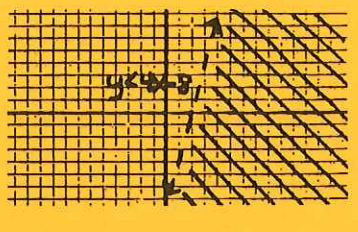
(6) 

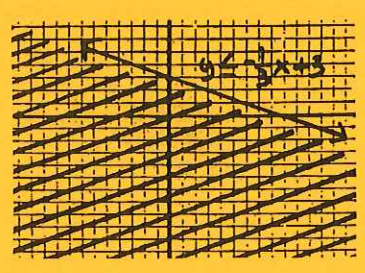
(7) 

(8) 

(9) 

(10) 

(11) 

(12) 

(13) $y=\frac{1}{4}x-3$ $m=1/4$ $(0,-3)$
$x-4y=12$ $m=1/4$ $(0,-3)$

dependent; consistent; inf

(14) $y-3=2(x+4)$ $m=2$ $(0,11)$
$2x-y=6$ $m=2$ $(0,-6)$
$y=2(x+4)+3$ $y=11$

independent; inconsistent; 0

(15) $x+2y=3$ $m=-\frac{1}{2}$
$y=-\frac{2}{3}x+4$ $m=-\frac{2}{3}$

independent; consistent; 1

(16) $2x-3y=15$
$3x-y=12$ mult by -3

$2x-3y=15$
$-9x+3y=-36$
$-7x=-21$
$x=3$

$3x-y=12$
$3(3)-y=12$
$9-y=12$
$y=-3$

$(3,-3)$

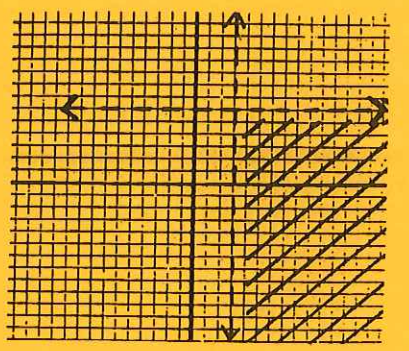
(17) $2x+6y=12$
$y=-\frac{1}{3}x+2$ $\frac{1}{3}x+y=2$ mult by -6

$2x+6y=12$
$-2x-6y=-12$
$0=0$ same line

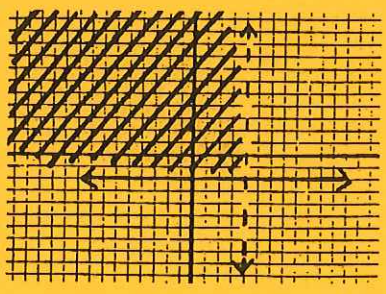
infinite number of solutions

9.5
Answer Key

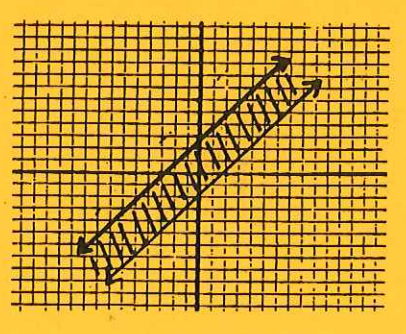
① $x > 3$
$y < 6$



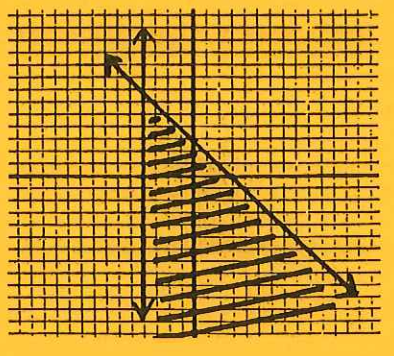
② $y \geq -2$
$x < 4$



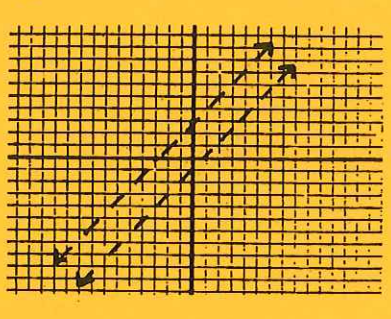
③ $y \leq x + 3$
$y \geq x - 2$



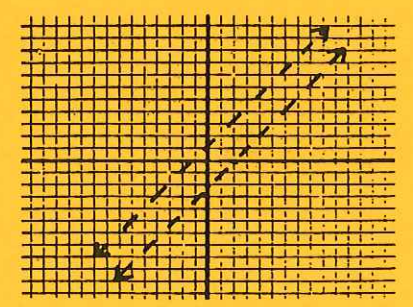
④ $x \geq -4$
$y \leq -x + 3$



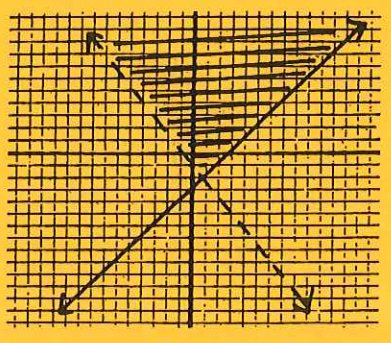
⑤ $y > x + 3$
$y < x - 1$ no solutions



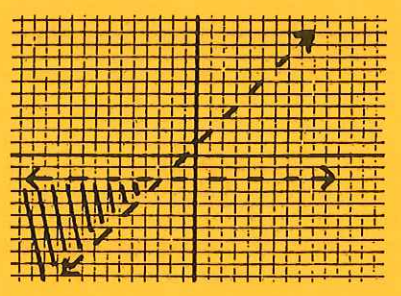
⑥ $y > x + 3\frac{1}{2}$
$y < x - 2$ no solutions



⑦ $y \geq x - 3$
$y > -x - 1$

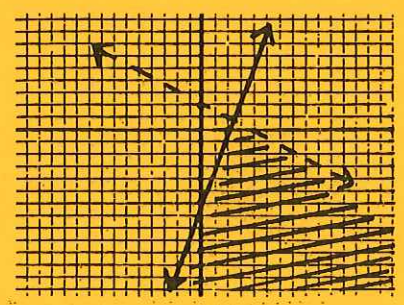


⑧ $y - x > 1 \rightarrow y > x + 1$
$y < -2$

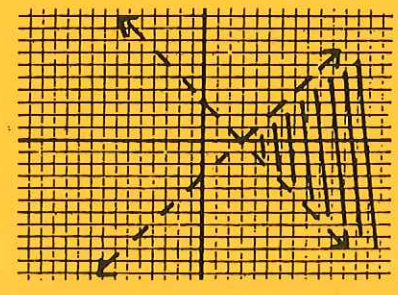


9.6
Answer Key

① $y < -\frac{1}{2}x + 2$
$y \leq 3x - 6$



② $|y| + 3 < x$
$|y| < x - 3$
$y < x - 3$ and $y > -x + 3$

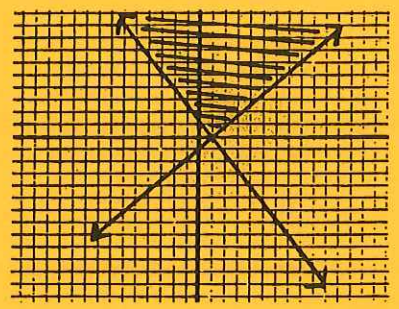


③ $|x-1| \leq y$

$x-1 \leq y$ and $x-1 \geq -y$

$y \geq x-1$ and $-y \leq x-1$

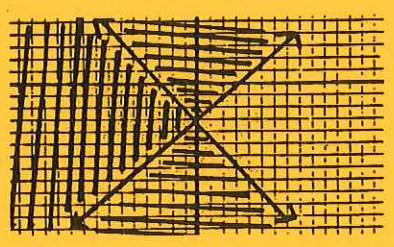
$y \geq x-1$ and $y \geq -x+1$



④ $|y+3| \geq x$

$y+3 \geq x$ or $y+3 \leq -x$

$y \geq x-3$ or $y \leq -x-3$

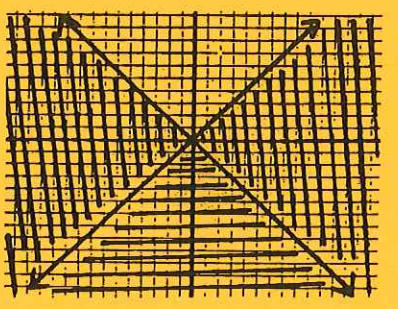


⑤ $|x| \geq y$

$x \geq y$ or $x \leq -y$

$y \leq x$ or $-y \geq x$

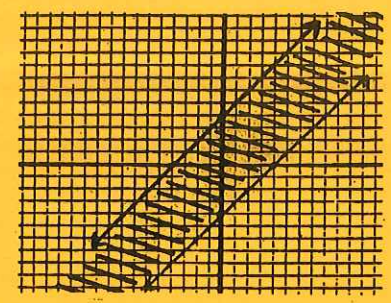
$y \leq x$ or $y \leq -x$



⑥ $|y-x| \leq 4$

$y-x \leq 4$ and $y-x \geq -4$

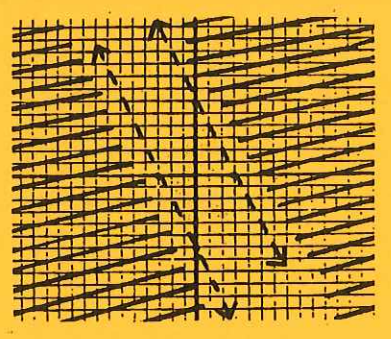
$y \leq x+4$ and $y \geq x-4$



⑦ $|2x+y| > 6$

$2x+y > 6$ or $2x+y < -6$

$y > -2x+6$ or $y < -2x-6$



⑧ $y \geq 3$

$x \leq -2$

⑨ $x \leq -4$

$y \leq -\frac{1}{2}x-5$

⑩ $x < -2$

$y < x$

⑪ $y < -\frac{1}{2}x+3$

$y > -\frac{1}{2}x-3$

9.7
Answer Key

① 2 digit number = tu

$t+u=13 \quad t=13-u$

$2t=5u-2$

$2(13-u)=5u-2$

$26-2u=5u-2$

$-7u=-28$

$u=4$

$t=13-u$

$t=13-(4)$

$t=9$ 94

② 2 digit number = tu

$t=u+6$

$10t+u=8(t+u)+2$

$10t+u=8t+8u+2$

$2t-7u=2$

$2(u+6)-7u=2$

$2u+12-7u=2$

$-5u=-10$

$u=2$

$t=u+6 \quad t=8$ 82

③ 2 digit number = tu

$t+u=12$

$u=2t$

$t+(2t)=12$

$3t=12$

$t=4$

$u=2(4)$

$u=8$ **48**

④ 2 digit number = tu

$u=2t+1$

$t+u=7$

$t+(2t+1)=7$

$3t+1=7$

$3t=6$

$t=2$

$u=2(2)+1$

$u=5$ **25**

⑤ 2 digit number = tu

$t+u=12 \quad t=12-u$

$10u+t=10t+u-18$

$9u-9t=-18$

$u-t=-2$

$u-(12-u)=-2$

$2u=10$

$u=5$

$t=12-(5)$

$t=7$ **75**

⑥ 2 digit number = tu

$t+u=7 \quad t=7-u$

$10u+t=4(10t+u)-3$

$10u+t=40t+4u-3$

$6u-39t=-3$

$6u-39(7-u)=-3$

$6u-273+39u=-3$

$45u=270$

$u=6$

$t=7-(6)$

$t=1$ **16**

⑦ 2 digit number = tu

$10t+u=7u$

$(10t+u)+18=10u+t$

$9t-9u=-18$

$t-u=-2$

$t=u-2$

$10(u-2)+u=7u$

$10u-20+u=7u$

$4u=20$

$u=5$

$t=(5)-2$

$t=3$ **35**

⑧ 2 digit number = tu

$t+u=9 \quad t=9-u$

$(10t+u)-45=10u+t$

$9t-9u=45$

$t-u=5$

$(9-u)-u=5$

$9-2u=5$

$-2u=-4$

$u=2$

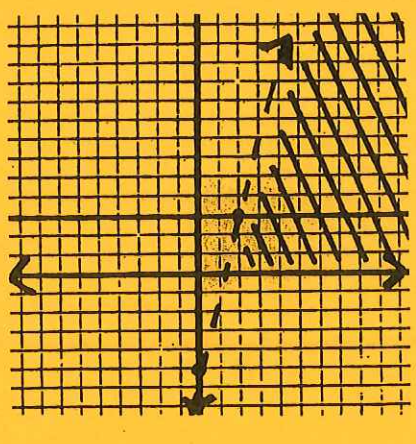
$t=9-(2)$

$t=7$ **72**

⑨ $4x-y>8$

$-y>-4x+8$

$y<4x-8$ and $y\geq -3$

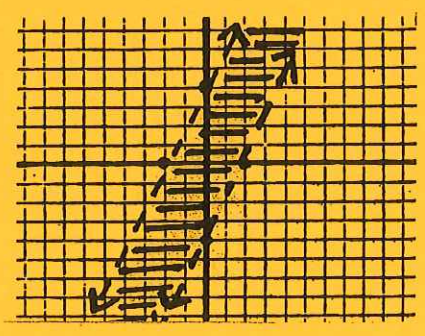


⑩ $|2x-y|<4$

$2x-y<4$ and $2x-y>-4$

$-y<-2x+4$ and $-y>-2x-4$

$y>2x-4$ and $y<2x+4$



9.8
Answer Key

① with wind $\frac{R}{r+w} \cdot \frac{T}{2/3} = \frac{D}{300}$

against $\frac{R}{r-w} \cdot \frac{T}{3/4} = \frac{D}{300}$

$\frac{2}{3}r+\frac{2}{3}w=300 \quad \div \frac{2}{3}$

$\frac{3}{4}r-\frac{3}{4}w=300 \quad \div \frac{3}{4}$

$r+w=450$

$r-w=400$

$2r=850$

$r=425$

$w=25$

plane	425 mph
wind	25 mph

②

	R	·	T	=	D
with wind	r+w	·	3	=	1800
against	r-w	·	4	=	2000

$3r+3w = 1800 \div 3 \quad r+w=600$
$4r-4w = 2000 \div 4 \quad r-w=500$
$2r = 1100$
$r=550$
$w=50$

Plane 550 mph, wind 50 mph

③ x= pounds of $.80 candy
y= pounds of $1.50 candy

$x+y=20$
$x=20-y$

$.8x+1.5y=20(1.01)$
$8x+15y=202$
$8(20-y)+15y=202$
$160-8y+15y=202$
$7y=42$
$y=6$
$x=20-(6)=14$

14 pounds @ $.80

④ x= small ones
y= large ones

$x+y=30$
$x=30-y$

$20x+35y=750$
$20(30-y)+35y=750$
$600-20y+35y=750$
$15y=150$
$y=10$
$x=30-(10)=20$

20 small, 10 large

⑤

	R	·	T	=	D
walking	x	·	4	=	4x
riding	y	·	1	=	y

$y=x+6$
$y=4x$

$(x+6)=4x \quad y=4(2)=8$
$-3x=-6$
$x=2$

rides 8 mph

⑥ x investment @ 10%
y investment @ 12%

$x+y=4000$
$x=4000-y$

$.10x+.12y=460$
$10x+12y=46000$
$10(4000-y)+12y=46000$
$40000-10y+12y=46000$
$2y=6000$
$y=3000$
$x=4000-(3000)=1000$

$1000 @ 10%, $3000 @ 12%

⑦ 2 digit number = tu

$t=u+4$
$(10t+u)+(10u+t)=154$
$11t+11u=154$
$11(u+4)+11u=154$
$11u+44+11u=154$
$22u=110$
$u=5$
$t=(5)+4=9$

95

⑧ $4x-y=6$ slope $-A/B=4$
$y=-4x+3$ slope $m=-4$

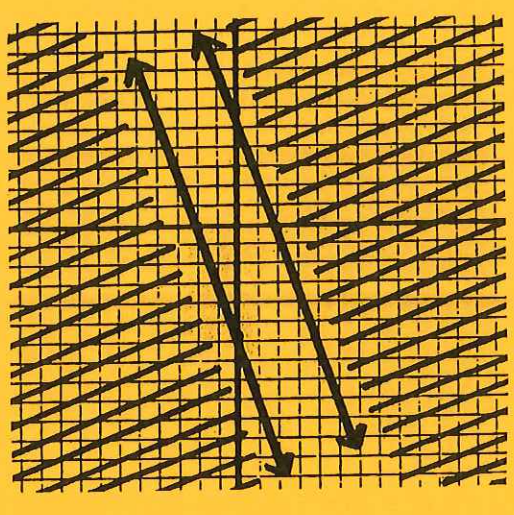
independent, consistent, 1

⑨ $|3x+y|+1 \geq 7$

$|3x+y| \geq 6$

$3x+y \geq 6$ or $3x+y \leq -6$

$y \geq -3x+6$ or $y \leq -3x-6$



⑩ $y \leq 6$ and $y \geq 2x+6$

⑪

	R	· T	= D
with wind	r+w	· 3/4	= 300
against	r−w	· 1/2	= 150

$\frac{3}{4}r + \frac{3}{4}w = 300 \quad \div \frac{3}{4}$

$\frac{1}{2}r - \frac{1}{2}w = 150 \quad \div \frac{1}{2}$

$r+w = 400$

$r-w = 300$

$2r = 700$

$r = 350$

$w = 50$

Plane 350 mph

wind 50 mph

⑫

	R	· T	= D
downstream	r+c	· 4	= 48
upstream	r−c	· 6	= 48

$4r+4c = 48 \quad \div 4$

$6r-6c = 48 \quad \div 6$

$r+c = 12$

$r-c = 8$

$2r = 20$

$r = 10$

$c = 2$

boat 10 mph

current 2 mph

⑬ p = pounds of peanuts

a = pounds of almonds

$p+a = 30$

$p = 30-a$

$1.65p + 2.10a = 1.83(30)$

$1.65p + 2.1a = 54.9$

$165p + 210a = 5490$

$165(30-a) + 210a = 5490$

$45a = 540$

$a = 12$

$p = 30-(12) = 18$

12 lbs almonds

18 lbs peanuts

⑭ a = apples

o = oranges

$a+o = 35$

$a = 35-o$

$.60a + .45o = 18$

$60a + 45o = 1800$

$60(35-o) + 45o = 1800$

$2100 - 60o + 45o = 1800$

$-15o = -300$

$o = 20$

$a = 35-(20) = 15$

20 oranges

15 apples

⑮

	R	· T	= D
run	r	· 2	= 2r
skate	s	· 3/2	= 3/2 s

$s = r+2$

$2r = \frac{3}{2}s$

$2r = \frac{3}{2}(r+2)$

$2r = \frac{3}{2}r + 3$

$4r = 3r + 6$

$r = 6$

run 6 mph

⑯ x = \$ invested @ 8%
y = \$ invested @ 12%

$x+y=6000$
$x=6000-y$

$x(.08)+y(.12)=640$
$8x+12y=64{,}000$
$8(6000-y)+12y=64{,}000$
$48{,}000-8y+12y=64{,}000$
$4y=16{,}000$
$y=4000$
$x=6000-(4000)=2000$

\$2000 @ 8%, \$4000 @ 12%

⑰ 2 digit number = tu

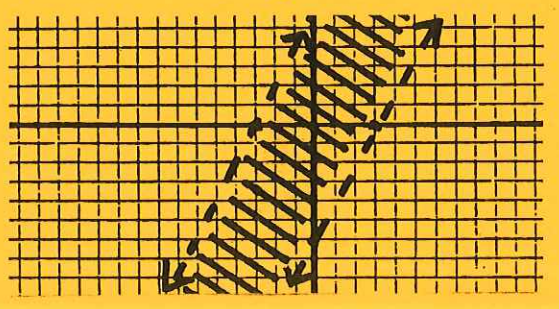
$t=u+3$
$(10u+t)+(10t+u)=99$
$11u+11t=99$
$11u+11(u+3)=99$
$11u+11u+33=99$
$22u=66$
$u=3$
$t=(3)+3=6$

63

⑱ $y=\frac{-2}{3}x+3$ slope $\frac{-2}{3}$ $(0,3)$
$2x+3y=5$ slope $\frac{-2}{3}$ $(0,\frac{5}{3})$
parallel lines

inclependent, inconsistent, 0

⑲ $|2x-y|<6$
$2x-y<6$ and $2x-y>-6$
$-y>-2x+6$ and $-y>-2x-6$
$y>2x-6$ and $y<2x+6$



⑳ $x<-3$ and $y>\frac{1}{2}x+3$

Unit 9 REVIEW Answer Key

① $y=\frac{2}{3}x+4$ slope $2/3$
$2x+3y=6$ slope $-2/3$

independent, consistent, 1

② $x-4y=8$ slope $1/4$ $(0,-2)$
$y=\frac{1}{4}x-2$ slope $1/4$ $(0,-2)$
same line

dependent, consistent, inf

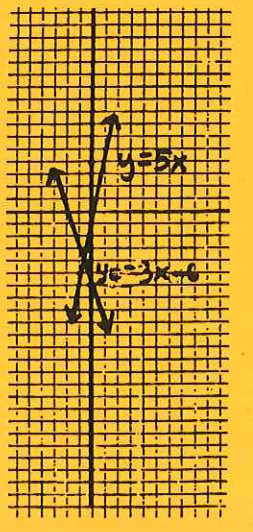
③ $y=-3x+5$ slope -3 $(0,5)$
$3x+y=7$ slope -3 $(0,7)$
parallel lines

independent, inconsistent, 0

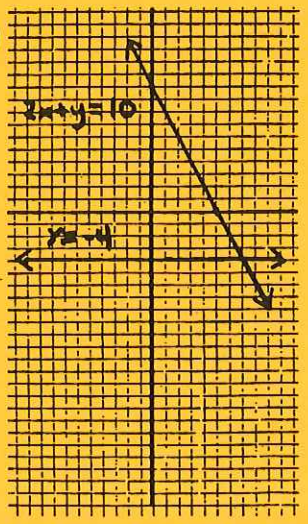
④ $y-2=3(x+2)$ slope 3
$y=\frac{1}{3}x+1$ slope $1/3$

independent, consistent, 1

⑤



⑥



⑦ $y=2x+1$
$3x-y=-4$
$3x-(2x+1)=-4$
$3x-2x-1=-4$
$x=-3$
$y=2(-3)+1=-5$
$\boxed{(-3,-5)}$

⑧ $2x=4y$
$x=2y$
$3x-2y=8$
$3(2y)-2y=8$
$6y-2y=8$
$4y=8$
$y=2$
$x=2(2)=4$
$\boxed{(4,2)}$

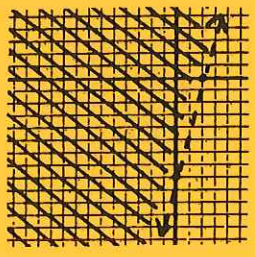
⑨ $3x+y=-2 \quad \times 3$
$4x+3y=4$
$-9x-3y=6$
$4x+3y=4$
$-5x=10$
$x=-2$
$3(-2)+y=-2$
$y=4$
$\boxed{(-2,4)}$

⑩ $2x-5y=16 \quad \times 3$
$3x+2y=5 \quad \times 2$
$-6x+15y=-48$
$6x+4y=10$
$19y=-38$
$y=-2$
$3x+2(-2)=5$
$x=3$
$\boxed{(3,-2)}$

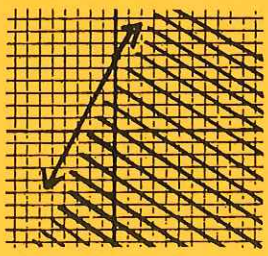
⑪ $\frac{1}{3}x+\frac{1}{3}y=5 \quad \times 6$
$\frac{2}{3}x-\frac{2}{3}y=-2 \quad \times 3$
$2x+2y=30$
$2x-2y=-6$
$4x=24$
$x=6$
$2(6)+2y=30$
$y=9$
$\boxed{(6,9)}$

⑫ $\frac{1}{2}x+2y=-10 \quad \times 2$
$\frac{1}{4}x-\frac{1}{4}y=5 \quad \times 4$
$x+4y=-20$
$-x+y=-20$
$5y=-40$
$y=-8$
$x+4(-8)=-20$
$x=12$
$\boxed{(12,-8)}$

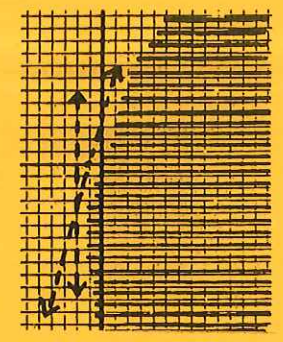
⑬



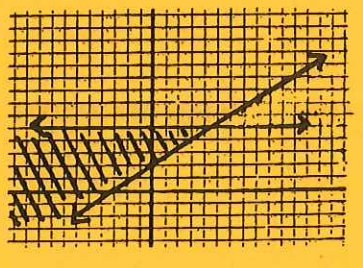
⑭ $2x-y\geq -6$
$-y\geq -2x-6$
$y\leq 2x+6$



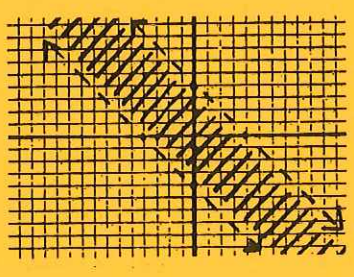
⑮



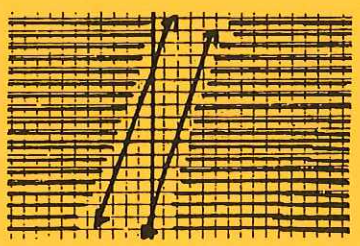
⑯



⑰ $|x+y|<4$
$x+y<4$ and $x+y>-4$
$y<-x+4$ and $y>-x-4$



⑱ $|3x-y|\geq 6$
$3x-y\geq 6$ or $3x-y\leq -6$
$y\leq 3x-6$ or $y\geq 3x+6$



⑲ $\boxed{\begin{array}{l} y\geq -2x+6 \\ y\geq -3 \end{array}}$

⑳ $\boxed{\begin{array}{l} y<-1/4x-2 \\ x<-4 \end{array}}$

(21) 2 digit number = tu

$t+u=11$

$u=4t+1$

$t+(4t+1)=11$

$5t=10$

$t=2$

$u=4(2)+1=9$

29

(22) 2 digit number = tu

$t+u=9$

$t=2u-3$

$(2u-3)+u=9$

$3u-3=9$

$3u=12$

$u=4$

$t=2(4)-3=5$

54

(23) 2 digit number = tu

$u=2t-12$

$10u+t=(10t+u)-45$

$9u-9t=-45 \quad \div 9$

$u-t=-5$

$(2t-12)-t=-5$

$t-12=-5$

$t=7$

$u=2(7)-12=2$

72

(24) 2 digit number = tu

$u=2t$

$10u+t=2(10t+u)-9$

$10u+t=20t+2u-9$

$8u-19t=-9$

$8(2t)-19t=-9$

$-3t=-9$ **36**

$t=3 \quad u=2(3)=6$

(25)

	R	×	T	=	D
downstream	r+c	×	3	=	60
upstream	r−c	×	6	=	60

$3r+3c=60 \quad \div 3$

$6r-6c=60 \quad \div 6$

$r+c=20$

$r-c=10$

$2r=30$

$r=15$

$c=5$

boat 15 mph
current 5 mph

(26)

	R	×	T	=	D
with wind	r+w	×	3½	=	600
against wind	r−w	×	2	=	600

$3\frac{1}{2}r+3\frac{1}{2}w=600 \quad \div 3\frac{1}{2}$

$2r-2w=600 \quad \div 2$

$r+w=400$

$r-w=300$

$2r=700$

$r=350$

$w=50$

plane 350 mph
wind 50 mph

(27) x = \$ invested @ 6%
y = \$ invested @ 10%

$x+y=12{,}000$

$x=12{,}000-y$

$.06x=.10y+80$

$6x=10y+8000$

$6(12{,}000-y)=10y+8000$

$72{,}000-6y=10y+8000$

$-16y=-64{,}000$

$y=4000$

$x=12{,}000-(4000)$

\$4000 @ 10%
\$8000 @ 6%

(28) x = \$ invested @ 8%
y = \$ invested @ 12%

$x+y=6400 \longrightarrow x=6400-y$

$.08x+.12y=712$

$8x+12y=71{,}200$

$8(6400-y)+12y=71{,}200$

$51{,}200-8y+12y=71{,}200$

$4y=20{,}000$

$y=5000$

$x=6400-(5000)$

$x=1400$

\$5000 @ 12%
\$1400 @ 8%

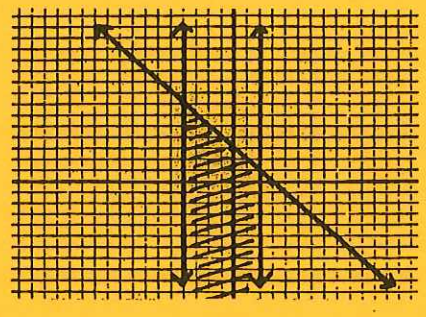
(29) $|x+1| \leq 3$

$x+1 \leq 3$ and $x+1 \geq -3$

$x \leq 2$ and $x \geq -4$

$(-4 \leq x \leq 2)$ and $x+y \leq 3$

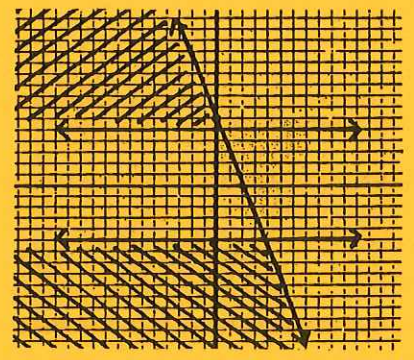
$\boxed{(-4 \leq x \leq 2) \text{ and } (y \leq -x+3)}$



(30) $|y| \geq 5$

$(y \geq 5$ or $y \leq -5)$ and $3x+y \leq 6$

$\boxed{(y \geq 5 \text{ or } y \leq -5) \text{ and } (y \leq -3x+6)}$



AB. VALUE GRAPHING

(1) $|y|-3<2$

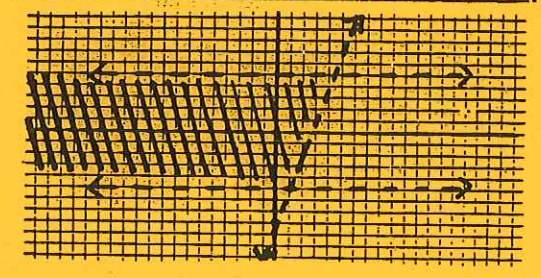
$|y|<5$

$(y<5$ and $y>-5)$ and $(y>3x-8)$

$3x-y<8$

$-y<-3x+8$

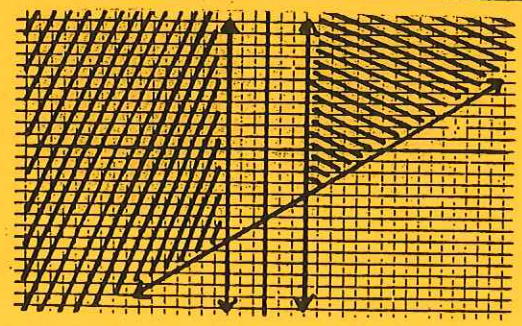
$\boxed{(-5<y<5) \text{ and } (y>3x-8)}$



(2) $|x|+4 \geq 7$

$|x| \geq 3$

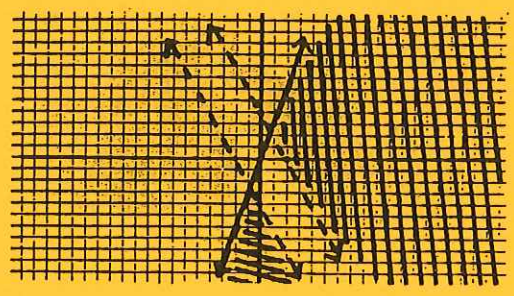
$\boxed{(x \geq 3 \text{ or } x \leq -3) \text{ and } (y \geq \frac{2}{3}x-6)}$



(3) $|2x+y|>4$

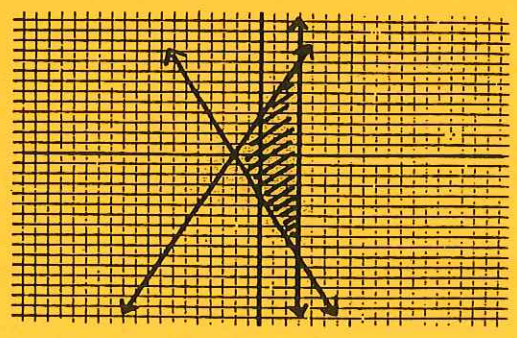
$2x+y>4$ or $2x+y<-4$

$\boxed{(y>-2x+4 \text{ or } y<-2x-4) \text{ and } (y \leq 3x)}$



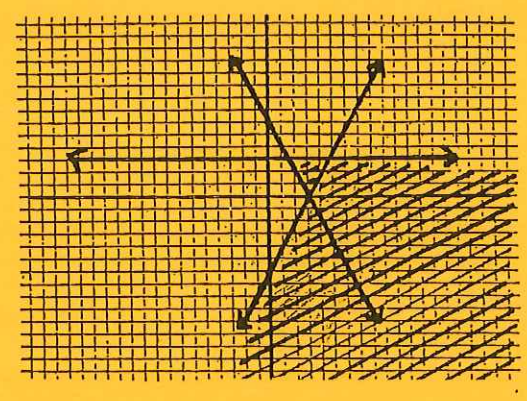
(4) $|y| \leq 2x+4$

$\boxed{(y \leq 2x+4 \text{ and } y \geq -2x-4) \text{ and } (x \leq 3)}$



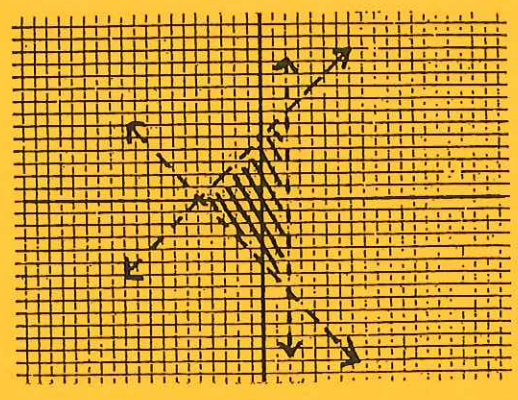
⑤ $|y| \geq -2x+6$

$(y \geq -2x+6$ or $y \leq 2x-6)$ and $(y \leq 3)$



⑥ $|y| < x+5$

$(y < x+5$ and $y > -x-5)$ and $(x < 2)$



Unit 9
SKILL CHECK - ANSWER KEY

① $y = \frac{2}{5}x - 4$ slope $\frac{2}{5}$ $(0,-4)$

$2x - 5y = 20$ slope $\frac{2}{5}$ $(0,-4)$

Same line

dependent, consistent, inf

② $3x - 2y = 4$ slope $3/2$

$y = \frac{2}{3}x + 1$ slope $2/3$

independent, consistent, 1

③ $y = 3x+1$

$5x - 2y = 1$

$5x - 2(3x+1) = 1$

$5x - 6x - 2 = 1$

$x = -3$

$y = 3(-3)+1$

$y = -8$

$(-3,-8)$

④ $4x - 3y = 3$ $\times 3$

$3x - 5y = 16$ $\times -4$

$12x - 9y = 9$

$-12x + 20y = -64$

$11y = -55$

$y = -5$

$4x - 3(-5) = 3$

$4x + 15 = 3$

$x = -3$

$(-3,-5)$

⑤ $\frac{4}{5}x + \frac{1}{5}y = 12$ $\times 5$

$\frac{3}{2}x - \frac{1}{2}y = 5$ $\times 2$

$4x + y = 60$

$3x - y = 10$

$7x = 70$

$x = 10$

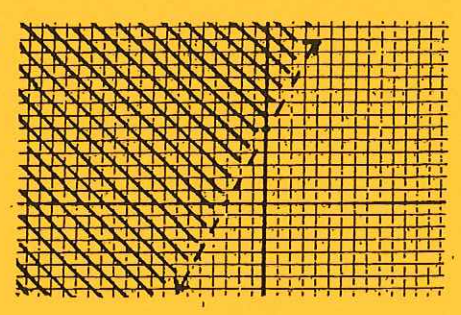
$3(10) - y = 10$

$30 - y = 10$

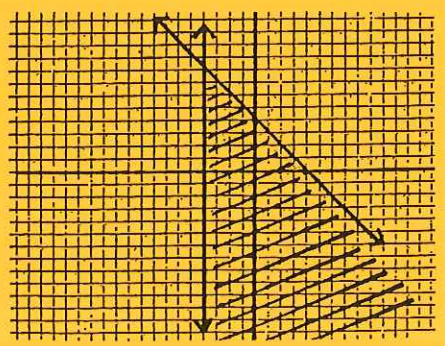
$y = 20$

$(10,20)$

⑥



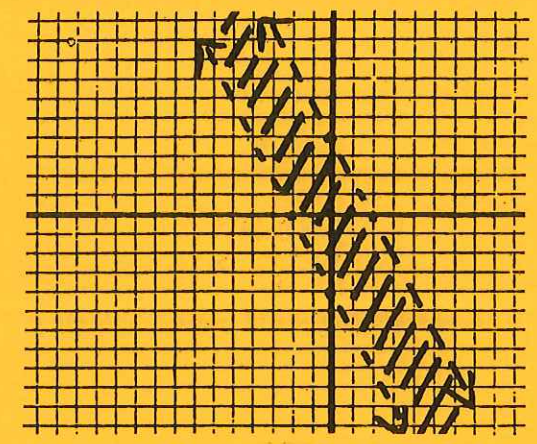
⑦



⑧ $|2x+y|<4$

$2x+y<4$ and $2x+y<-4$

$\boxed{(y<-2x+4) \text{ and } (y>-2x-4)}$



⑨ $\boxed{x<-6 \text{ and } y<x+3}$

⑩ 2 digit number $= tu$

$t = 2u$

$10t+u = 2(10u+t)-12$

$10t+u = 20u+2t-12$

$8t-19u = -12$

$8(2u)-19u = -12$

$16u-19u = -12$

$-3u = -12$

$u = 4$

$t = 2(4) = 8$ $\boxed{84}$

⑪

	R	× T	= D
upstream	r-c	× 5	= 30
downstream	r+c	× 2	= 28

$5r-5c = 30 \quad \div 5$

$2r+2c = 28 \quad \div 2$

$r-c = 6$

$r+c = 14$

$2r = 20$

$r = 10$

$c = 4$

$\boxed{\text{boat 10 mph}}$
$\boxed{\text{current 4 mph}}$

⑫ $x = \$$ invested @ 8%

$y = \$$ invested @ 9%

$x+y = 10{,}000$

$y = 10{,}000-x$

$.08x+.09y = 860$

$8x+9y = 86{,}000$

$8x+9(10{,}000-x) = 86{,}000$

$8x+90{,}000-9x = 86{,}000$

$-x = -4000$

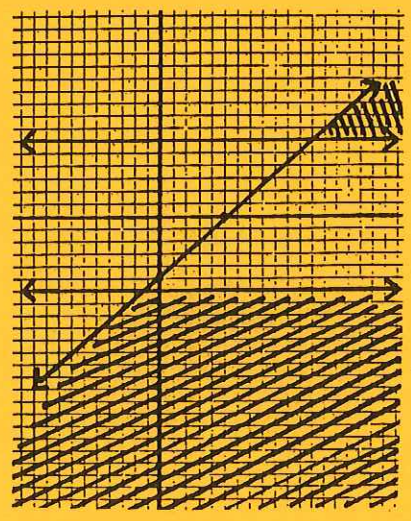
$x = 4000$

$y = 10{,}000-(4000) = 6000$

$\boxed{\$4000 \text{ @ } 8\%, \$6000 \text{ @ } 9\%}$

⑬ $|y| \geq 6$

$\boxed{(y \geq 6 \text{ or } y \leq -6) \text{ and } (y \leq x-5)}$



Unit 9

REMEDIATION - ANSWER KEY

① $4x-y=6$ slope 4
$y=\frac{-3}{2}x+1$ slope $-3/2$

independent, consistent, 1

② $6x-2y=3$ slope 3 $(0,-3/2)$
$y=3x+6$ slope 3 $(0,6)$
parallel lines

independent, inconsistent, 0

③ $y=-3x+2$
$5x+2y=6$

$5x+2(-3x+2)=6$
$5x-6x+4=6$
$-x=2$
$x=-2$
$y=-3(-2)+2=8$

$(-2,8)$

④ $5x-4y=-11$ $\times 3$
$3x+3y=-12$ $\times 4$

$15x-12y=-33$
$12x+12y=-48$
$27x=-81$
$x=-3$

$5(-3)-4y=-11$
$y=-1$

$(-3,-1)$

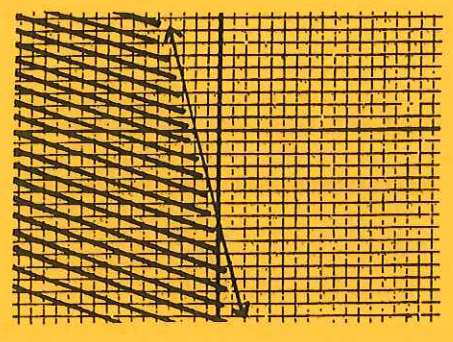
⑤ $\frac{2}{3}x-\frac{1}{3}y=14$ $\times 3$
$\frac{1}{6}x+\frac{1}{6}y=-1$ $\times 6$

$2x-y=42$
$x+y=-6$
$3x=36$
$x=12$

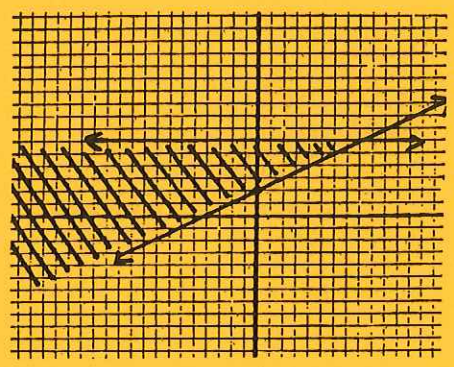
$(12)+y=-6$
$y=-18$

$(12,-18)$

⑥

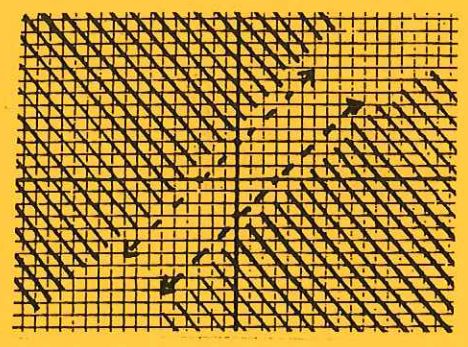


⑦



⑧ $|x-y|>3$
$x-y>3$ or $x-y<-3$
$-y>-x+3$ or $-y<-x-3$

$(y<x-3$ or $y>x+3)$



⑨

$y<2$
$y>\frac{-1}{2}x+2$

⑩ 2 digit number = tu

$t = 2u - 3$

$(10u + t) + 2(10t + u) = 153$

$10u + t + 20t + 2u = 153$

$12u + 21t = 153$

$12u + 21(2u - 3) = 153$

$12u + 42u - 63 = 153$

$54u = 216$

$u = 4$

$t = 2(4) - 3 = 5$

54

⑪

	R	× T	= D
with wind	r+w	× 2	= 600
against	r−w	× 2	= 520

$2r + 2w = 600$

$2r - 2w = 520$

$4r = 1120$

$r = 280$

$w = 20$

plane 280 mph
wind 20 mph

⑫ x = $ invested @ 10%

y = $ invested @ 7%

$x + y = 7000$

$y = 7000 - x$

$.10x + .07y = 550$

$10x + 7y = 55{,}000$

$10x + 7(7000 - x) = 55{,}000$

$10x + 49{,}000 - 7x = 55{,}000$

$3x = 6000$

$x = 2000$

$y = 7000 - (2000) = 5000$

$2000 @ 10%, $5000 @ 7%

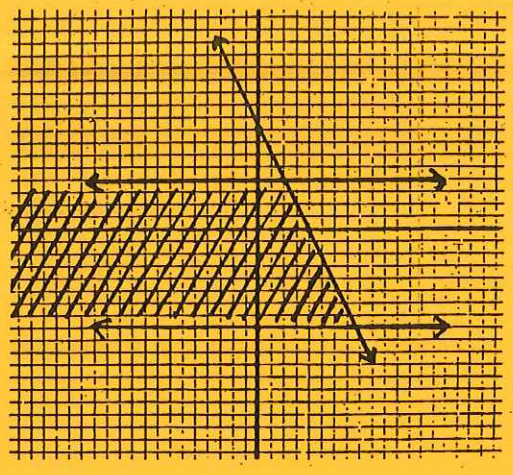
⑬ $|y + 2| \leq 6$

$y + 2 \leq 6$ and $y + 2 \geq -6$

$(y \leq 4$ and $y \geq -8)$ and $(2x + y \leq 8)$

$(-8 \leq y \leq 4)$ and $(y \leq -2x + 8)$

graph in next column



Unit 9
EXTRA PRACTICE ANSWER KEY

① $3x - y = 6$ slope = 3 y-int −6

$y = 3x + 6$ slope = 3 y-int 6

independent, inconsistent, 0

② $x - 2y = 8$ slope = ½ y-int −4

$y = \frac{1}{2}x - 4$ slope = ½ y-int −4

dependent, consistent, inf

③ $2x + 3y = 12$ slope = $-\frac{2}{3}$ y-int 4

$y = -\frac{2}{3}x + 4$ slope = $-\frac{2}{3}$ y-int 4

dependent, consistent, inf

④ $y - 2 = \frac{-3}{4}(x - 1)$ slope = $-\frac{3}{4}$

$4x + 3y = 10$ slope = $-\frac{4}{3}$

independent, consistent, 1

⑤ $x = 3y$

$2x - y = 10$

$2(3y) - y = 10$

$6y - y = 10$

$5y = 10$

$y = 2$

$x = 3(2)$

$x = 6$

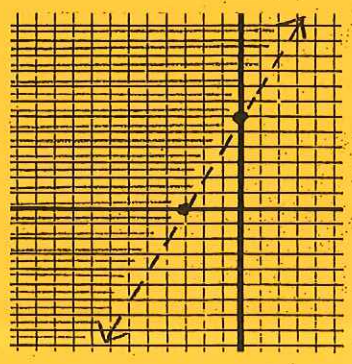
(6, 2)

⑥ $y=-3x-5$
$2x+3y=6$
$2x+3(-3x-5)=6$
$2x-9x-15=6$
$-7x=21$
$x=-3$
$y=-3(-3)-5$
$y=4$
$\boxed{(-3,4)}$

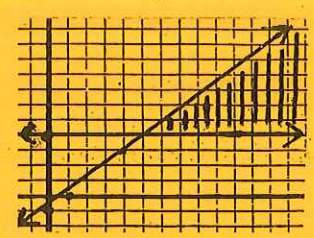
⑦ $3x-y=17 \times 5$
$2x+5y=0$
$15x-5y=85$
$2x+5y=0$
$17x=85$
$x=5$
$3(5)-y=17$
$-y=2 \quad y=-2$
$\boxed{(5,-2)}$

⑧ $4x+3y=13 \times -3$
$3x+4y=22 \times 4$
$-12x-9y=-39$
$12x+16y=88$
$7y=49$
$y=7$
$4x+3(7)=13$
$4x=-8$
$x=-2$
$\boxed{(-2,7)}$

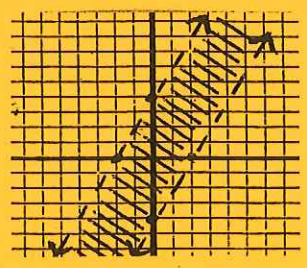
⑨ $y>2x+6$



⑩ $y \geq 4 \quad y \leq x-1$



⑪ $|2x-y|>4$
$2x-y>4$ or $2x-y<-4$
$-y>-2x+4$ or $-y<-2x-4$
$y<2x-4$ or $y>2x+4$



⑫ $\boxed{\begin{array}{l} y<-2 \\ y<2x+4 \end{array}}$

⑬ number = tu
$t+u=9 \quad u=9-t$
$3u=2t-3$
$3(9-t)=2t-3$
$27-3t=2t-3$
$-5t=-30$
$t=6$
$u=9-(6)=3$
$\boxed{63}$

⑭ number = tu
$u=4t-1$
$10u+t=10t+u+45$
$9u-9t=45$
$u-t=5$
$(4t-1)-t=5$
$3t=6$
$t=2$
$u-(2)=5$
$u=7 \quad \boxed{27}$

⑮

	R	T	D
down	$(r+c)$	$\cdot 3$	$=42$
up	$(r-c)$	$\cdot 7$	$=42$

$3r+3c=42$
$7r-7c=42$
$r+c=14$
$r-c=6$
$2r=20$
$r=10$
$c=4$
$\boxed{\begin{array}{l} \text{boat } 10\text{mph} \\ \text{current } 4\text{mph} \end{array}}$

⑯ x = 8% investment
y = 6% investment
$x+y=9000$
$.08x+.06y=612$
$x=9000-y$
$.08(9000-y)+.06y=612$
$720-.08y+.06y=612$
$720-.02y=612$
$-.02y=-108$
$y=$ \$5400 @ 6%
$x=$ \$3600 @ 8%

⑰ $\frac{3}{5}x+\frac{2}{5}y=-2 \times 5$
$3x-\frac{1}{2}y=-35 \times 4$
$3x+2y=-10$
$12x-2y=-140$
$15x=-150$
$x=-10$
$3(-10)+2y=-10$
$-30+2y=-10$
$2y=20$
$y=10$
$\boxed{(-10,10)}$

⑱ $|y| \geq 4 \quad y \geq 4$ or $y \leq -4$
$y \geq -2x+4$