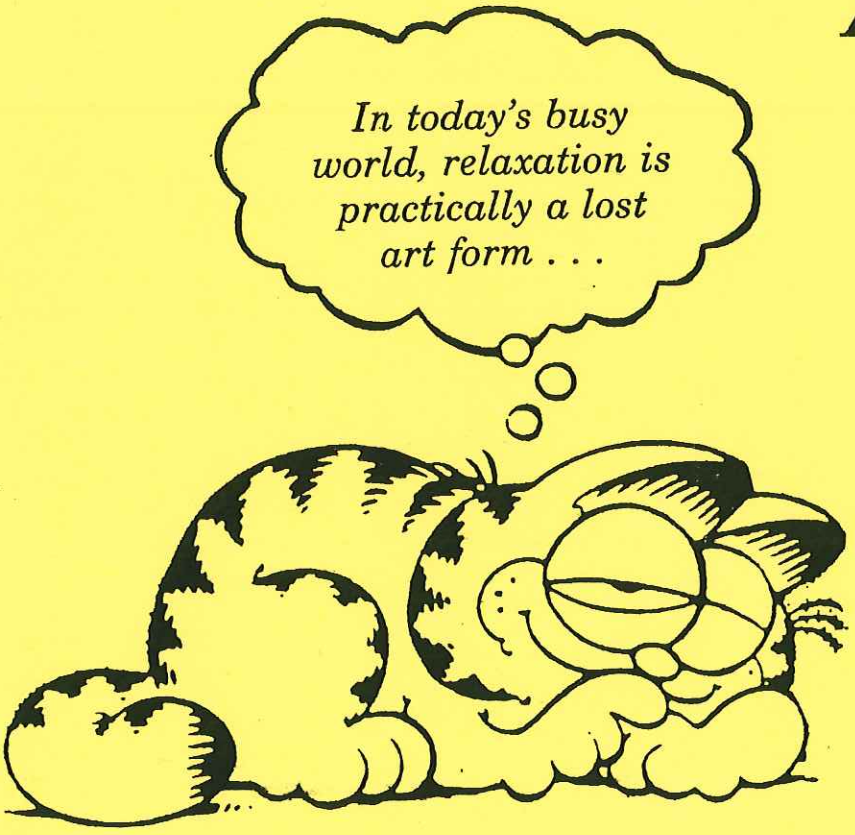
Friendship Jr. High School
Accelerated Math Program

Algebra



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UNIT #1
Foundation Skills

UNIT #2
Solving Equations

UNIT #3
Solving Inequalities

1.1

Answer Key

① Transitive Property of Equality

② Additive Identity

③ Associative Property of Multiplication

④ Commutative Property of Addition

⑤ Reflexive Property of Equality

⑥ Multiplicative Inverse

⑦ Distributive Property

⑧ Symmetric Property of Equality

⑨ Zero Property

⑩ Closure

⑪ Substitution Property of Equality

⑫ Commutative Property of Multiplication

⑬ Additive Inverse

⑭ Associative Property of Addition

⑮ Multiplicative Identity

⑯ Commutative Property of Addition

⑰ Transitive Property of Equality

⑱ Associative Property of Multiplication

⑲ Reflexive Property of Equality

⑳ Distributive Property

㉑ Zero Property

㉒ Substitution Property of Equality

㉓ Additive Inverse

㉔ Multiplicative Identity

㉕ Commutative Property of Addition

㉖ Commutative Property of Multiplication

㉗ Associative Property of Addition

㉘ Closure

㉙ Symmetric Property of Equality

㉚ Multiplicative Inverse

㉛ Commutative Property of Addition

㉜ Additive Identity

㉝ Substitution Property of Equality

㉞ Reflexive Property of Equality

㉟ Transitive Property of Equality

1.2

Answer Key

① $n-9$

② $2n+14$

③ $4n-2$

④ $(n+5)(4n-3)$

⑤ n = the number
$n-19=83$
$n=\boxed{102}$

⑥ n = the number

$67 - 2n = 39$
$-2n = -28$
$(-2n)(-\frac{1}{2}) = (-28)(-\frac{1}{2})$
$n =$ **14**

⑦ n = Tyrone's age

$2n + 17 = 53$
$2n = 36$
$(2n)(\frac{1}{2}) = (36)(\frac{1}{2})$
$n =$ **18 years old**

⑧

	now	27 ago
Clarice	n	n − 27

$n - 27 = 21$ $n =$ **48 yrs old**

⑨ Bill's height = n + 5
Bob's height = n

$(n) + (n+5) = 137$
$2n + 5 = 137$
$2n = 132$ $n =$ **66 in. tall**

⑩ Mary Lou's height = n

$2n + 17 = 141$
$2n = 124$
$(2n)(\frac{1}{2}) = (124)(\frac{1}{2})$
$n =$ **62 in. tall**

⑪

	now	5 ago
Dad	n + 27	n + 22
Bob	n	n − 5

$(n+22) + (n-5) = 45$
$2n + 17 = 45$
$2n = 28$
$(\frac{1}{2})(2n) = (\frac{1}{2})(28)$
$n = 14$

14 yrs old

⑫

	now	in 8
Mom	56 − n	64 − n
Daughter	n	n + 8

$(64-n) = 2(n+8)$
$64 - n = 2n + 16$
$64 - 3n = 16$
$-3n = -48$
$(-\frac{1}{3})(-3n) = (-\frac{1}{3})(-48)$
$n =$ **16 yrs old**

⑬

	now	5 ago
Bill	50 − n	45 − n
Roy	n	n − 5

$(45-n) = 3(n-5)$
$45 - n = 3n - 15$
$45 - 4n = -15$
$-4n = -60$
$(-\frac{1}{4})(-4n) = (-\frac{1}{4})(-60)$
$n = 15$
$\text{Bill} = 50 - n = 50 - 15 = 35$
next year = **36 yrs old**

⑭

	now	3 ago
Alice	n + 22	n + 19
Gert	n	n − 3

$n+19 = 2(n-3)$
$n+19 = 2n-6$
$-n+19 = -6$
$-n = -25$
$n = 25$

25 yrs old

⑮

	now	next yr
Sheila	n	n + 1
Sister	n + 2	n + 3

$(n+1) + (n+3) = 42$
$2n + 4 = 42$
$2n = 38$
$(\frac{1}{2})(2n) = (\frac{1}{2})(38)$
$n = 19$
$\text{Sister} = n + 2 = 19 + 2 = 21$

Sister n + 2 = **21 yrs old**

1.3

Answer Key

① $3a-2b$
$3(-2)-2(2)$
$(-6)-(4)=\boxed{-10}$

② $b-3c$
$(2)-3(-1)$
$(2)-(-3)$
$(2)+(3)=\boxed{5}$

③ $2ab-c^2$
$2(-2)(2)-(-1)^2$
$(-8)-(1)=\boxed{-9}$

④ $4ac+b^3$
$4(-2)(-1)+(2)^3$
$(8)+(8)=\boxed{16}$

⑤ $2a(b-c)$
$2(-2)((2)-(-1))$
$2(-2)(3)=\boxed{-12}$

⑥ $3b(2c-2a)$
$3(2)[2(-1)-2(-2)]$
$3(2)(2)=\boxed{12}$

⑦ $4a^2b-2ac$
$4(-2)^2(2)-2(-2)(-1)$
$4(4)(2)-2(-2)(-1)$
$(32)-(4)=\boxed{28}$

⑧ $3a+2bc^3$
$3(-2)+2(2)(-1)^3$
$(-6)+(-4)=\boxed{-10}$

⑨ $3a(a-c)$
$3(-2)((-2)-(-1))$
$3(-2)(-1)$
$\boxed{6}$

⑩ $b^2(2c+3a)$
$(2)^2[2(-1)+3(-2)]$
$(4)(-8)=\boxed{-32}$

⑪ $\frac{2ab}{3a^2c}=\frac{2(-2)(2)}{3(-2)^2(-1)}$
$\frac{-8}{-12}=\boxed{\frac{2}{3}}$

⑫ $\frac{-3bc}{ac^3}=\frac{-3(2)(-1)}{(-2)(-1)^3}$
$\frac{6}{2}=\boxed{3}$

⑬ $a^2c-2abc$
$(-2)^2(-1)-2(-2)(2)(-1)$
$(-4)-(8)=\boxed{-12}$

⑭ $-3ab-2c^4$
$-3(-2)(2)-2(-1)^4$
$(12)-(2)=\boxed{10}$

⑮ $3n-m+4n+6m$
$\boxed{7n+5m}$

⑯ $2a-3b-5a+b$
$\boxed{-3a-2b}$

⑰ $2(x+y)-3x$
$2x+2y-3x$
$\boxed{-x+2y}$

⑱ $4n-2(m-3n)$
$4n-2m+6n$
$\boxed{10n-2m}$

⑲ $2x^2-3xy+2x(x-y)$
$2x^2-3xy+2x^2-2xy$
$\boxed{4x^2-5xy}$

⑳ $3a(a+b)-2ab-a^2$
$3a^2+3ab-2ab-a^2$
$\boxed{2a^2+ab}$

㉑ $4(2a-1)-3(2-a)$
$8a-4-6+3a$
$\boxed{11a-10}$

㉒ $-3(b-2)+4(3-2b)$
$-3b+6+12-8b$
$\boxed{-11b+18}$

㉓ $a-3b(a-1)+b$
$a-3ab+3b+b$
$\boxed{a-3ab+4b}$

㉔ $2x-3x(y-2)+3xy$
$2x-3xy+6x+3xy$
$\boxed{8x}$

㉕ $2n-3$

㉖ $(n+1)(2n-7)$

㉗

	now	in 4
Sue	$n+8$	$n+12$
Mary	n	$n+4$

$2(n+4)=n+12$
$2n+8=n+12$
$n=4$

Mary last yr $n-1$
$n-1=3$
$\boxed{3 \text{ yrs old}}$

㉘

	now	9 ago
Bart	n	$n-9$
Jim	$30-n$	$21-n$

$n-9=2(21-n)$
$n-9=42-2n$
$3n=51$
$(\frac{1}{3})(3n)=(\frac{1}{3})(51)$
$n=17$
Bart = $\boxed{17 \text{ yrs old}}$

㉙ Multiplicative Inverse

Unit 1
REVIEW
Answer Key

① Reflexive Property of Equality

② Closure

③ Multiplicative Identity

④ Transitive Property of Equality

⑤ Multiplicative Inverse

⑥ Substitution Property of Equality

⑦ Commutative Property of Addition

⑧ Additive Identity

⑨ Distributive Property

⑩ Commutative Property of Multiplication

⑪ Associative Property of Multiplication

⑫ Symmetric Property of Equality

⑬ Additive Inverse

⑭ Commutative Property of Addition

⑮ Zero Property

⑯ Associative Property of Addition

⑰ Substitution Property of Equality

⑱ $5n-3$

⑲ $2n+7$

⑳ $(n-9)(3n)$

㉑ $2n+(4n-2)$

㉒ n = the number

$2n-12=2$

$2n=14$ $\quad n=\boxed{7}$

㉓ n = the number

$4n+3=27$

$4n=24$ $\quad n=\boxed{6}$

㉔

	now	6 ago
Simon	$n+4$	$n-2$
Art	n	$n-6$

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

$n-2=3n-18$

$16=2n$ $\quad n=8$

$(n+4)+2=14$

$\boxed{14 \text{ yrs old}}$

㉕

	now	4 ago
Betty	$n-6$	$n-10$
Jean	n	$n-4$

$2(n-10)=n-4$

$2n-20=n-4$

$n=16$

Jean is 16 now

$21-16=5$

$\boxed{\text{Jean will be 21 in 5 years}}$

(26)

	now	in 2
Jennifer	$14-n$	$16-n$
Liz	n	$n+2$

$16-n=2(n+2)$
$16-n=2n+4$
$12=3n$
$n=4$ **6 yrs older**
Jen is 10, Liz is 4

(27)

	now	6 ago
Evan	$24-n$	$18-n$
Krista	n	$n-6$

$18-n=3(n-6)$
$18-n=3n-18$
$36=4n$
$n=9$
$n-1=8$ **8 yrs old**

(28) $5xy-z^2$
$5(-1)(-2)-(3)^2$
$(10)-(9)=\boxed{1}$

(29) $2x^2y-4z$
$2(-1)^2(-2)-4(3)$
$2(1)(-2)-4(3)$
$(-4)-(12)=\boxed{-16}$

(30) $3(x-2y)-y^2$
$3((-1)-2(-2))-(-2)^2$
$3[(-1)-(-4)]-(4)$
$3(3)-(4)$
$(9)-(4)=\boxed{5}$

(31) $4y-2(2x+y)$
$4(-2)-2[2(-1)+(-2)]$
$4(-2)-2(-4)$
$(-8)-(-8)$
$(-8)+(8)=\boxed{0}$

(32) $3x^3-y^3$
$3(-1)^3-(-2)^3$
$3(-1)-(-8)$
$(-3)+(8)$
$\boxed{5}$

(33) $2xy-x^3z$
$2(-1)(-2)-(-1)^3(3)$
$2(-1)(-2)-(-1)(3)$
$(4)-(-3)$
$(4)+(3)=\boxed{7}$

(34) $\frac{-2x}{3x^2z}=\frac{-2(-1)}{3(-1)^2(3)}=\frac{(2)}{3(1)(3)}=\boxed{\frac{2}{9}}$

(35) $\frac{xyz}{2x^5}=\frac{(-1)(-2)(3)}{2(-1)^5}=\frac{(6)}{2(-1)}=\frac{6}{-2}=\boxed{-3}$

(36) $a+2c-3a-2c=\boxed{-2a}$

(37) $4x-y-5x-3y=\boxed{-x-4y}$

(38) $2(3n-m)-2n+m$
$6n-2m-2n+m=\boxed{4n-m}$

(39) $4a-3(2a-1)+2$
$4a-6a+3+2=\boxed{-2a+5}$

(40) $2x(x-2y)-3(x^2+1)$
$2x^2-4xy-3x^2-3=\boxed{-x^2-4xy-3}$

(41) $2ab-3(a-3ab)+2a$
$2ab-3a+9ab+2a=\boxed{11ab-a}$

(42) $6x-2x(x+3)-3x^2$
$6x-2x^2-6x-3x^2=\boxed{-5x^2}$

(43) $4n(m-n)-3m(n-1)$
$4nm-4n^2-3nm+3m$
$\boxed{-4n^2+nm+3m}$

(44) $7x-3(x-2y)+5xy$
$7x-3x+6y+5xy$
$\boxed{4x+6y+5xy}$

Unit 1

SKILL CHECK - ANSWER KEY

① Multiplicative Identity

② Reflexive Property of Equality

③ Substitution Property of Equality

④ Symmetric Property of Equality

⑤ $(2n-2)(n+3)$

⑥ n = the number
$4n-12=16$
$4n=28$ $\quad n=\boxed{7}$

⑦

	now	6 ago
Ben	$24-n$	$18-n$
Bill	n	$n-6$

$n-6=2(18-n)$
$n-6=36-2n$
$3n=42$
$n=14$
Ben $(24-n)=10$
next birthday = $\boxed{11 \text{ yrs old}}$

⑧ $3(2x-y)$
$3[2(-3)-(-1)]$
$3(-6-(-1))$
$3(-5) = \boxed{-15}$

⑨ $2xy^3-3xz^2$
$2(-3)(-1)^3-3(-3)(2)^2$
$2(-3)(-1)-3(-3)(4)$
$(6)-(-36)=\boxed{42}$

⑩ $2y-3(xy-z)$
$2(-1)-3[(-3)(-1)-(2)]$
$2(-1)-3[(3)+(-2)]$
$(-2)-3(1)$
$(-2)+(-3) = \boxed{-5}$

⑪ $4ab-3a(b-2a)-5a^2$
$4ab-3ab+6a^2-5a^2$
$\boxed{ab+a^2}$

⑫ $3(x^2-xy)-2x(x-4y)-2xy$
$3x^2-3xy-2x^2+8xy-2xy$
$\boxed{x^2+3xy}$

⑬ $a(3a-b)-ab-2(a^2-b)$
$3a^2-ab-ab-2a^2+2b$
$\boxed{a^2-2ab+2b}$

⑭

	in 3	now	2 ago
Jenny	$2n$	$2n-3$	$2n-5$
Craig	n	$n-3$	$n-5$

$2n-5=7(n-5)$
$2n-5=7n-35$
$30=5n$
$n=6$

now
J 9
C+3
$\boxed{12}$

Unit 1

REMEDIATION - ANSWER KEY

① Commutative Property of Addition

② Associative Property of Multiplication

③ Multiplicative Inverse

④ Reflexive Property of Equality

⑤ $(n+3)+(4n-5)$

⑥ n = the number
$2n+3=25$
$2n=22$ $\quad n=\boxed{11}$

⑦

	now	8 ago
Ann	$2n$	$2n-8$
Murray	n	$n-8$

$2n-8=4(n-8)$
$2n-8=4n-32$
$24=2n$
$n=12$
2 yrs ago $(n-2)=\boxed{10 \text{ yrs old}}$

⑧ $2(3b-c)$
$2[3(-2)-(-3)]$
$2[(-6)+(3)]$
$2(-3)=\boxed{-6}$

⑨ $3ab^2-2b^3$
$3(2)(-2)^2-2(-2)^3$
$3(2)(4)-2(-8)$
$(24)+(16)=\boxed{40}$

⑩ $3ac-2[bc-a]$
$3(2)(-3)-2[(-2)(-3)-(2)]$
$(-18)-2(4)=\boxed{-26}$

⑪ $2xy-3z(x-2)+z-xz$
$2xy-3xz+6z+z-xz$
$\boxed{2xy-4xz+7z}$

⑫ $2a(a-ab)-3a^2(2-b)-a^2b$
$2a^2-2a^2b-6a^2+3a^2b-a^2b$
$\boxed{-4a^2}$

⑬ $4x(x-2y)-xy-3(x^2+xy)$
$4x^2-8xy-xy-3x^2-3xy$
$\boxed{x^2-12xy}$

⑭

	4 ago	now	in 2
Tom	$4n$	$4n+4$	$4n+6$
Jerry	n	$n+4$	$n+6$

$4n+6=2(n+6)$
$4n+6=2n+12$
$2n=6$
$n=3$
Tom now $(4n+4)=16$ $\quad \boxed{15 \text{ yrs old}}$
last year $=15$

Unit 1

EXTRA PRACTICE - ANSWER KEY

① Symmetric Property of Equality

② Multiplicative Inverse

③ Transitive Property of Equality

④ Zero Property

⑤ Commutative Property of Addition

⑥ Additive Identity

⑦ $3n-12$

⑧ $(2n-4)(n+5)$

⑨ n = the number

$2n-4=16$

$2n=20$

$n=\boxed{10}$

⑩

	now	6 ago
Dennis	$n-4$	$n-10$
Margaret	n	$n-6$

$n-6=3(n-10)$

$n-6=3n-30$

$-2n=-24$

$n=12$

$n-1=$ $\boxed{\text{11 years old}}$

⑪

	now	In 5
Dobie	n	$n+5$
Maynard	$35-n$	$40-n$

$n+5=2(40-n)$

$n+5=80-2n$

$3n=75$

$n=25$

$35-n=$ $\boxed{\text{10 years old}}$

⑫ $2x+y$

$2(-1)+(-2)$

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

⑬ $3y^2-2z$

$3(-2)^2-2(-3)$

$3(4)-2(-3)$

$(12)-(-6)$

$(12)+(+6)=\boxed{18}$

⑭ $3(x+z)-2y$

$3[(-1)+(-3)]-2(-2)$

$3(-4)-2(-2)$

$(-12)-(-4)$

$(-12)+(4)=\boxed{-8}$

⑮ $2xyz-x^3$

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

$2(-1)(-2)(-3)-(-1)$

$(-12)-(-1)$

$(-12)+(1)=\boxed{-11}$

⑯ $3x-2y+x-4y$

$\boxed{4x-6y}$

⑰ $3a-2(4a+3)-5$

$3a-8a-6-5$

$\boxed{-5a-11}$

⑱ $2y^2-4y(x-2y)+6xy$

$2y^2-4xy+8y^2+6xy$

$\boxed{10y^2+2xy}$

⑲

	now	3 ago	In 3
Mike	$3n+3$	$3n$	$3n+6$
Tony	$n+3$	n	$n+6$

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

$3n+6=2n+12$

$n=6$ $3n+3=\boxed{\text{21 yrs old}}$

⑳ $4a^2-5ab+2a(b-3a)-3(a^2+2ab)$

$4a^2-5ab+2ab-6a^2-3a^2-6ab$

$\boxed{-5a^2-9ab}$

2.1
Answer Key

① $\frac{1}{2}(6x+8y)-\frac{1}{3}(6x+9y)$
$3x+4y-2x-3y = \boxed{x+y}$

② $-\frac{3}{7}(21x+35a)+\frac{4}{7}(35x-21a)$
$-6x-10a+20x-12a = \boxed{14x-22a}$

③ $\frac{3}{4}(4a-12b)+\frac{1}{8}(16a+48b)$
$3a-9b+2a+6b = \boxed{5a-3b}$

④ $\frac{5}{6}(-24a+36b)+(\frac{1}{3})(60a-42b)$
$-20a+30b-20a+14b$
$\boxed{-40a+44b}$

⑤ $\frac{1}{2}(-\frac{1}{3}a+\frac{2}{3}b)+\frac{2}{3}(\frac{1}{2}a-\frac{3}{4}b)$
$-\frac{1}{6}a+\frac{1}{3}b+\frac{1}{3}a-\frac{1}{2}b$
$-\frac{1}{6}a+\frac{2}{6}a+\frac{2}{6}b-\frac{3}{6}b = \boxed{\frac{1}{6}a-\frac{1}{6}b}$

⑥ $\frac{1}{2}(-\frac{2}{3}a-\frac{3}{4}b)-\frac{3}{4}(\frac{4}{9}a-\frac{1}{2}b)$
$-\frac{1}{3}a-\frac{3}{8}b-\frac{1}{3}a+\frac{3}{8}b = \boxed{-\frac{2}{3}a}$

⑦ $\frac{3a+9}{3} = \boxed{a+3}$ ⑧ $\frac{6x+24}{6} = \boxed{x+4}$

⑨ $\frac{7a+35}{-7} = \boxed{-a-5}$ ⑩ $\frac{14n-56}{-7} = \boxed{-2n+8}$

⑪ $\boxed{\frac{25x+14}{5}}$ ⑫ $\boxed{\frac{-3n-8}{4}}$

⑬ $\frac{16n-8x}{-12}$ $\boxed{\frac{-4n+2x}{3}}$

⑭ $\frac{15x-10y}{-10}$ $\boxed{\frac{-3x+2y}{2}}$

⑮ $\frac{14n-10m}{-4} = \boxed{\frac{-7n+5m}{2}}$

⑯ $\frac{20a-30b}{12} = \boxed{\frac{10a-15b}{6}}$

2.2
Answer Key

① $\frac{4x+5}{7}$
$4x+5=49$
$4x=44$
$\boxed{x=11}$

② $\frac{4n+8}{16}=7$
$4n+8=112$
$4n=104$
$\boxed{n=26}$

③ $\frac{3n-5}{-7}=n+5$
$3n-5=-7n-35$
$10n=-30$
$\boxed{n=-3}$

④ $\frac{2x+6}{2}=3x+11$
$2x+6=6x+22$
$-4x=16$
$\boxed{x=-4}$

⑤ $3-4x=10x+10$
$-14x=7$
$\boxed{x=-\frac{1}{2}}$

⑥ $3x-5=7x+7$
$-4x=12$
$\boxed{x=-3}$

⑦ $17+2n=21+2n$
$17=21$
false equation
$\boxed{\text{no solutions}}$

⑧ $-5x-1=-5x-1$
$-1=-1$
identity
$\boxed{\text{all solutions}}$

⑨ $-3(n+5)=3(n-1)$
$-3n-15=3n-3$
$-6n=12$
$\boxed{n=-2}$

⑩ $4(2a-1)=-10(a-5)$
$8a-4=-10a+50$
$18a=54$
$\boxed{a=3}$

2.3
Answer Key

(11) $-2(2x-3)=6-4x$
$-4x+6=6-4x$
$6=6$ identity
all solutions

(12) $5n+4=7(n+1)-2n$
$5n+4=7n+7-2n$
$5n+4=5n+7$
$4=7$ false eq
no solutions

(13) $3(x-5)=\frac{1}{5}(10x-25)$
$3x-15=2x-5$
$x=10$

(14) $4(2n-8)=\frac{1}{7}(49n+70)$
$8n-32=7n+10$
$n=42$

(15) $\frac{2n-6}{3}=\frac{3(n+2)}{2}$
$\frac{2n-6}{3}=\frac{3n+6}{2}$
$2(2n-6)=3(3n+6)$
$4n-12=9n+18$
$-5n=30$
$n=-6$

(16) $\frac{5x-4}{6}=\frac{4(2-x)}{-8}$
$\frac{5x-4}{6}=\frac{8-4x}{-8}$
$-8(5x-4)=6(8-4x)$
$-40x+32=48-24x$
$-16x=16$
$x=-1$

(17) $x+r=2d$
$x=2d-r$

(18) $5x=y$
$x=\frac{y}{5}$

(19) $\frac{d+x}{e}=f$
$d+x=ef$
$x=ef-d$

(20) $\frac{x+a}{b}=c$
$x+a=bc$
$x=bc-a$

(21) $ax+b=c$
$ax=c-b$
$x=\frac{c-b}{a}$ for $a\neq 0$

(22) $ex-2y=3z$
$ex=3z+2y$
$x=\frac{3z+2y}{e}$ for $e\neq 0$

(23) $ax-b=cx-3b$
$ax-cx=-2b$
$x(a-c)=-2b$
$x=\frac{-2b}{a-c}$ for $a\neq c$

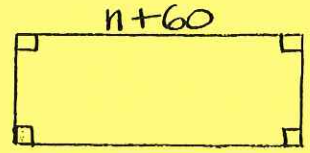
(24) $dx+c=2x$
$dx-2x=-c$
$x(d-2)=-c$
$x=\frac{-c}{d-2}$ for $d\neq 2$

① n = the number
$2n+4n=96$
$6n=96$
$n=16$

② n = the number
$2n+12=3n-31$
$-n=-43$
$n=43$

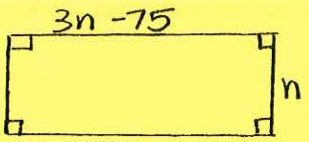
③ n = the number
$n-(2n-5)=9$
$n-2n+5=9$
$-n+5=9$
$-n=4$
$n=-4$
must use parenthesis

④ n = the number
$5n-(2n+4)=119$
$5n-2n-4=119$
$3n-4=119$
$3n=123$
$n=41$

⑤


$2n+2(n+60)=920$
$2n+2n+120=920$
$4n=800$
$n=200$ m width
$n+60=260$ m

⑥



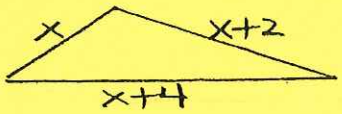
$2n+2(3n-75)=370$
$2n+6n-150=370$
$8n=520$
$n=65$ width
$3n-75=120$ length

65 by 120 yds

⑦ n = original price

$\frac{1}{2}n+8=40$
$\frac{1}{2}n=32$
$n=64$ **$64**

⑧



$(x)+(x+2)+(x+4)=27$
$3x+6=27$
$3x=21$
$x=7$ $x+4=$ **11 cm**

⑨

x =	30
$x+2$ =	32
$x+4$ =	34
$x+6$ =	36

$2x+(x+6)=96$
$3x+6=96$
$3x=90$
$x=30$

⑩ x = 57
$x+2$ = 59
$x+4$ = 61
$x+6$ = **63** ←

$x+2(x+2)=175$
$x+2x+4=175$
$3x+4=175$
$3x=171$ $x=57$

⑪ $\frac{2}{3}(-6x-3y)-\frac{1}{2}(4y+8x)$
$-4x-2y-2y-4x$ **$-8x-4y$**

⑫ $\frac{-28x+35y}{-21}=$ **$\frac{4x-5y}{3}$**

⑬ $2a+8x+b=ax$
$8x-ax=-2a-b$
$x(8-a)=-2a-b$

$x=\frac{-2a-b}{8-a}$ for $a\neq 8$

⑭ $\frac{4x-2}{7}=\frac{2(2-x)}{-5}$
$-5(4x-2)=7(4-2x)$
$-20x+10=28-14x$
$-6x=18$

$x=-3$

2.4
Answer Key

① $\frac{\text{part}}{\text{whole}}$ $\frac{28}{n}=\frac{20}{100}$
$20n=2800$
$n=$ **140**

② $\frac{\text{part}}{\text{whole}}$ $\frac{37}{296}=\frac{n}{100}$
$296n=3700$
$n=12.5$ **12.5%**

③ $\frac{\text{part}}{\text{whole}}$ $\frac{n}{6070}=\frac{4.3}{100}$
$100n=(6070)(4.3)$
$100n=26,101$
$n=$ **$261.01**

④ $\frac{\text{part}}{\text{whole}}$ $\frac{n}{9.40}=\frac{6.125}{100}$
$100n=(9.40)(6.125)$
$100n=57.575$
$n=.57575$ **$.58**

⑤ $\frac{\text{part}}{\text{whole}}$ $\frac{7030.50}{n}=\frac{107.5}{100}$
$107.5n=(7030.50)(100)$
$107.5n=703,050$
$n=$ **$6540**

⑥ $\frac{\text{part}}{\text{whole}}$ $\frac{54,000}{n}=\frac{108.4}{100}$
$108.4n=(54,000)(100)$
$108.4n=5,400,000$
$n\approx$ **$49,815.50**

⑦ part/whole $\frac{n}{5000} = \frac{.1}{100}$

$100n = 500$

$n = \boxed{\$5}$

⑧ part/whole $\frac{90}{n} = \frac{60}{100}$

$60n = 9000$

$n = \boxed{150}$

⑨ correct/tot ques $\frac{34}{n} = \frac{85}{100}$

$85n = 3400$

$n = \boxed{40 \text{ questions}}$

⑩ metal/tot ore $\frac{n}{180} = \frac{3.2}{100}$

$100n = 576$

$n = \boxed{5.76 \text{ kg}}$

⑪ purch pr/org pr $\frac{21.45}{n} = \frac{75}{100}$

$75n = 2145$

$n = 28.6$

$\$28.60 - \$21.45$

$\boxed{\$7.15}$

⑫ discount/org pr $\frac{2.72}{n} = \frac{8}{100}$

$8n = 272$

$n = 34$

$34 - 2.72 = \boxed{\$31.28}$

⑬ n = total sales

$.08n + 125 = 200$

$.08n = 75$

$n = \boxed{\$937.50}$

⑭ n = total sales

$.055n + 320 = 551$

$.055n = 231$

$n = \boxed{\$4200}$

⑮ n = total sales

$.06n + 3(215) = 975$

$.06n + 645 = 975$

$.06n = 330$

$n = \boxed{\$5500}$

⑯ n = total sales

$.075 + 2(190) = 665$

$.075n + 380 = 665$

$.075n = 285$

$n = \boxed{\$3800}$

⑰ $\frac{1}{4}(-\frac{2}{3}a - \frac{1}{2}b) - \frac{2}{3}(\frac{3}{4}b - \frac{1}{2}a)$

$-\frac{1}{6}a - \frac{1}{8}b - \frac{1}{2}b + \frac{1}{3}a$

$\boxed{\frac{1}{6}a - \frac{5}{8}b}$

⑱ $\frac{24a - 36b}{-18} = \boxed{\frac{-4a + 6b}{3}}$

⑲ $3(4n-2) = \frac{2}{3}(9n-9) + 6n$

$12n - 6 = 6n - 6 + 6n$

$12n - 6 = 12n - 6$

$-6 = -6$ identity

$\boxed{\text{all solutions}}$

⑳ $\frac{3(2x-1)}{7} = \frac{5x+4}{8}$

$\frac{6x-3}{7} = \frac{5x+4}{8}$

$48x - 24 = 35x + 28$

$13x = 52$

$\boxed{x = 4}$

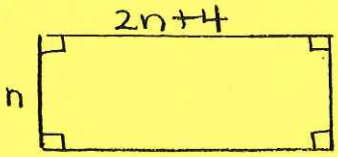
㉑ $3ab - c = 2ac$

$3ab - 2ac = c$

$a(3b - 2c) = c$

$\boxed{a = \frac{c}{3b-2c} \text{ for } 3b \neq 2c}$

㉒



$2(n) + 2(2n+4) = 56$

$2n + 4n + 8 = 56$

$6n = 48$

$n = 8$

dimensions

8 by 20

$8 \times 20 = 160$

$\boxed{160 \text{ in}^2}$

㉓ 6 x

7 $x+1$

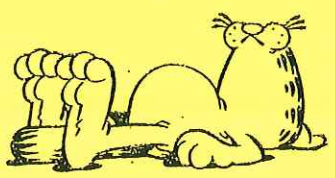
$\rightarrow \boxed{8}$ $x+2$

$3x - 2(x+1) = 4$

$3x - 2x - 2 = 4$

$x - 2 = 4$

$x = 6$



Unit 2
REVIEW
Answer Key

① $\frac{2}{3}(9x-6y)-\frac{3}{4}(8y-4x)$

$6x-4y-6y+3x = \boxed{9x-10y}$

② $\frac{1}{2}(4a-3b)-\frac{1}{4}(6b+8a)$

$2a-\frac{3}{2}b-\frac{3}{2}b-2a = \boxed{-3b}$

③ $\frac{-10x-15y}{-5}$

$\boxed{2x+3y}$

④ $\frac{18a-12b}{6}$

$\boxed{3a-2b}$

⑤ $\frac{-26m+18n}{12}$

$\boxed{\frac{-13m+9n}{6}}$

⑥ $\frac{20a-15b}{-10}$

$\boxed{\frac{-4a+3b}{2}}$

⑦ $\frac{3n-5}{-4} = n-11$

$3n-5 = -4n+44$

$7n = 49$

$\boxed{n=7}$

⑧ $\frac{-2x+5}{5} = 2x+13$

$-2x+5 = 10x+65$

$-12x = 60$

$\boxed{x=-5}$

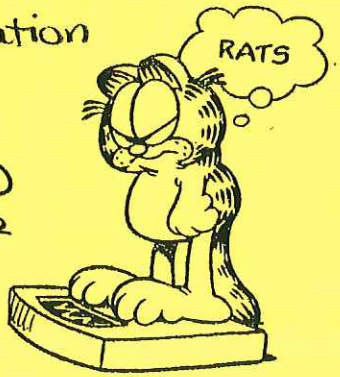
⑨ $3(4n-1) = 2(3n+4)+6n$

$12n-3 = 6n+8+6n$

$12n-3 = 12n+8$

$-3 = 8$ False equation

$\boxed{\text{no solutions}}$



⑩ $5(6-3x) = 3(x+4)$

$30-15x = 3x+12$

$-18x = -18$

$\boxed{x=1}$

⑪ $\frac{1}{2}(5n-4) = 2n-1$

$\frac{5n}{2}-2 = 2n-1$

$5n-4 = 4n-2$

$\boxed{n=2}$

⑫ $\frac{3}{4}(n+3) = 3-3n$

$\frac{3n}{4}+\frac{9}{4} = 3-3n$

$3n+9 = 12-2n$

$15n = 3$

$\boxed{n=1/5}$

⑬ $\frac{3x-5}{4} = \frac{6(2-x)}{-9}$

$\frac{3x-5}{4} = \frac{12-6x}{-9}$

$-27x+45 = 48-24x$

$-3x = 3$

$\boxed{x=-1}$

⑭ $\frac{2(n+4)}{-3} = \frac{5n+7}{12}$

$\frac{2n+8}{-3} = \frac{5n+7}{12}$

$24n+96 = -15n-21$

$39n = -117$

$\boxed{n=-3}$

⑮ $4ax-ab = 3c-cx$

$4ax+cx = ab+3c$

$x(4a+c) = ab+3c$

$\boxed{x=\frac{ab+3c}{4a+c} \text{ for } 4a+c\neq 0}$

⑯ $2y+3ax = 4y+x$

$3ax-x = 2y$

$x(3a-1) = 2y$

$\boxed{x=\frac{2y}{3a-1} \text{ for } a\neq\frac{1}{3}}$

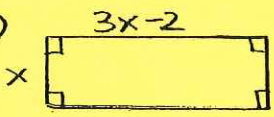
(17) n = a number

$2n-(4n+3)=-13$
$2n-4n-3=-13$
$-2n=-10$
$n=\boxed{5}$

(18) n = a number

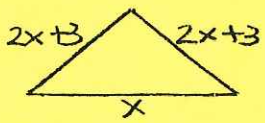
$n-(2n-5)=7$
$n-2n+5=7$
$-n=2$
$n=\boxed{-2}$

(19)



$2(x)+2(3x-2)=28$
$2x+6x-4=28$
$8x=32$
$x=4$
$3x-2=10$
4 by 10
Area = $\boxed{40\text{cm}^2}$

(20)



$(x)+2(2x+3)=41$
$x+4x+6=41$
$5x=35$
$x=7$ $\boxed{7\text{in}}$

(21)

$2 \quad x$
$3 \quad x+1$
$\rightarrow \boxed{4} \quad x+2$
$5 \quad x+3$

$x+3(x+3)=17$
$x+3x+9=17$
$4x=8$
$x=2$

(22)

$-7 \quad x$
$-6 \quad x+1$
$\rightarrow \boxed{-5} \quad x+2$

$(x+2)-(2x+1)=8$
$x+2-2x-1=8$
$-x+1=8$
$-x=7$
$x=-7$

(23)

$7 \quad x$
$\rightarrow \boxed{9} \quad x+2$
$11 \quad x+4$

$2(x+4)-(x+2)=13$
$2x+8-x-2=13$
$x+6=13$
$x=7$

(24)

$10 \quad x$
$12 \quad x+2$
$\rightarrow \boxed{14} \quad x+4$

$3x-2(x+4)=2$
$3x-2x-8=2$
$x-8=2$
$x=10$

(25) $\frac{\text{part}}{\text{whole}} \quad \frac{24}{64}=\frac{n}{100}$

$64n=2400$
$n=37.5$
$\boxed{37.5\%}$

(26) $\frac{\text{part}}{\text{whole}} \quad \frac{n}{85}=\frac{2.2}{100}$

$100n=187$
$n=1.87$
$\boxed{1.87}$

(27) $\frac{\text{part}}{\text{whole}} \quad \frac{210.75}{n}=\frac{105.375}{100}$

$105.375n=21075$
$n=200$
$\boxed{\$200}$

(28) $\frac{\text{part}}{\text{whole}} \quad \frac{149.10}{n}=\frac{106.5}{100}$

$106.5n=14910$
$n=140$ $\boxed{\$140}$

(29) $\frac{\text{purch pr}}{\text{org pr}} \quad \frac{30.60}{n}=\frac{90}{100}$

$90n=3060$
$n=34$ $\boxed{\$34}$

(30) $\frac{\text{discount}}{\text{org pr}} \quad \frac{5.40}{n}=\frac{15}{100}$

$15n=540$
$n=36$
$\$36-\$5.40=$ $\boxed{\$30.60}$

(31) n = sales

$.12n+3(170)=918$
$.12n+510=918$
$.12n=408$
$n=3400$ $\boxed{\$3400}$

(32) n = Sales

$.075n+2(205)=620$
$.075n+410=620$
$.075n=210$
$n=2800$ $\boxed{\$2800}$

Unit 2
SKILL CHECK - ANSWER KEY

① $\frac{2}{5}(10a-15b)-\frac{1}{3}(6b+3a)$

$4a-6b-2b-a = \boxed{3a-8b}$

② $\frac{-8x-12y}{-6} = \boxed{\frac{4x+6y}{3}}$

③ $\frac{4x-2}{3} = x+1$

$4x-2 = 3x+3$ $\boxed{x=5}$

④ $\frac{3}{4}(n-2)=n$

$\frac{3n}{4}-\frac{6}{4}=n$

$3n-6=4n$

$-n=6$ $\boxed{n=-6}$

⑤ $2(5x-3)=7(x-1)+3x$

$10x-6=7x-7+3x$

$10x-6=10x-7$

$-6=-7$ false equation

$\boxed{\text{no solutions}}$

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

$\frac{6n-12}{4} = \frac{4n-4}{2}$

$12n-24=16n-16$

$-4n=8$ $\boxed{n=-2}$

⑦ $2x-ab=3c-2ab$

$2x=3c-ab$

$\boxed{x=\frac{3c-ab}{2}}$

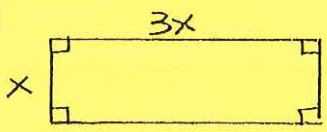
⑧ $xy-2n=3x+5$

$xy-3x=5+2n$

$x(y-3)=5+2n$

$\boxed{x=\frac{5+2n}{y-3} \text{ for } y\neq 3}$

⑨



$2(x)+2(3x)=32$

$2x+6x=32$

$8x=32$

$x=4$ $3x=12$

$4\times 12 = \boxed{48\ in^2}$

⑩

-10 x

$\rightarrow$ $\boxed{-9}$ $x+1$

-8 $x+2$

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

$x+2-2x-12=10$

$x=-10$

⑪ $\frac{\text{part}}{\text{whole}}$ $\frac{n}{120} = \frac{4.375}{100}$

$100n=525$ $n=\boxed{5.25}$

⑫ $\frac{\text{part}}{\text{whole}}$ $\frac{84.4}{n} = \frac{105.5}{100}$

$105.5n=8440$

$n=80$ $\boxed{\$80}$

⑬ $\frac{\text{purch pr}}{\text{org pr}}$ $\frac{21.12}{n} = \frac{88}{100}$

$88n=2112$

$n=24$

org pr $=\$24$

$\$24-\$21.12 = \boxed{\$2.88}$

⑭ $.065x+3(230)=976$

$.065x+690=976$

$.065x=286$

$x=4400$

$\boxed{\$4400}$

Unit 2
REMEDIATION - ANSWER KEY

① $\frac{3}{4}(8x-12y)-\frac{2}{5}(20y+5x)$

$6x-9y-8y-2x=$ $\boxed{4x-17y}$

② $\frac{14n-21m}{-14}=\frac{2n-3m}{-2}=\boxed{\frac{-2n+3m}{2}}$

③ $\frac{3n-7}{2}=2n-6$

$3n-7=4n-12$

$-n=-5$ $\boxed{n=5}$

④ $\frac{1}{2}(3x-4)=x+7$

$\frac{3x}{2}-2=x-7$

$3x-4=2x-14$ $\boxed{x=-10}$

⑤ $4(a-3)=2(3a-6)-2a$

$4a-12=6a-12-2a$

$4a-12=4a-12$

$-12=-12$ identity

$\boxed{\text{all solutions}}$

⑥ $\frac{2(5n-1)}{-8}=\frac{3n+1}{-2}$

$\frac{10n-2}{-8}=\frac{3n+1}{-2}$

$-20n+4=-24n-8$

$4n=-12$ $\boxed{n=-3}$

⑦ $2a-4n=3a+b$

$-4n=a+b$

$\boxed{n=\frac{-a-b}{4}}$

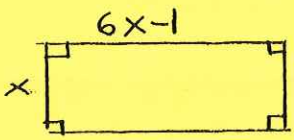
⑧ $nm+x=xy-2n$

$nm+2n=xy-x$

$n(m+2)=xy-x$

$\boxed{n=\frac{xy-x}{m+2} \text{ for } m\neq -2}$

⑨



$2(x)+2(6x-1)=26$

$2x+12x-2=26$

$14x=28$

$x=2$

$6x-1=11$

$\boxed{2 \text{ by } 11 \text{ m}}$

⑩

-5 x

-3 $x+2$

-1 $x+4$

$\rightarrow$ $\boxed{1}$ $x+6$

$3(x+6)-2(2x+2)=11$

$3x+18-2x-2=11$

$x+16=11$

$x=-5$

⑪ $\frac{\text{part}}{\text{whole}}$ $\frac{n}{54}=\frac{6.75}{100}$

$100n=364.5$ $\boxed{n=3.645}$

⑫ $\frac{\text{part}}{\text{whole}}$ $\frac{7.75}{n}=\frac{12.5}{100}$

$12.5n=775$

$n=62$ $\boxed{\$62}$

⑬ $\frac{\text{discount}}{\text{org pr}}$ $\frac{2.90}{n}=\frac{20}{100}$

$20n=290$

$n=14.5$

org pr $=\$14.50$

$\$14.50-\$2.90=$ $\boxed{\$11.60}$

⑭ $.0825x+4(125)=599$

$.0825x+500=599$

$.0825x=99$

$x=1200$

$\boxed{\$1200}$

Unit 2

EXTRA PRACTICE - ANSWER KEY

① $\frac{2}{3}(12x-9y)-\frac{1}{3}(6x+3y)$

$8x-6y-2x-y$

$\boxed{6x-7y}$

② $\frac{15a-20b}{5}$

$\boxed{3a-4b}$

③ $\frac{-12x-10y}{-8}$

$\boxed{\frac{6x+5y}{4}}$

④ $\frac{4n-2}{7}=-2$

$4n-2=-14$

$4n=-12$

$\boxed{n=-3}$

⑤ $4(2x-5)=2(4x+3)$

$8x-20=8x+6$

$-20=6$

false equation

$\boxed{\text{no solutions}}$

⑥ $3(x-4)=2(3x-8)-2$

$3x-12=6x-16-2$

$-3x=-6$

$\boxed{x=2}$

⑦ $\frac{3}{4}(2n-2)=2(n+1)-2$

$\frac{6n}{4}-\frac{6}{4}=2n+2-2$

$4\left[\frac{6n}{4}-\frac{6}{4}=2n\right]$

$6n-6=8n$

$-2n=6$

$\boxed{n=-3}$

⑧ $3n-2(4n+1)=8-5(n+2)$

$3n-8n-2=8-5n-10$

$-5n-2=-5n-2$

$-2=-2$ identity

$\boxed{\text{all solutions}}$

⑨ $\frac{4a-3}{7}=\frac{-3(a+2)}{3}$

$3(4a-3)=-21(a+2)$

$12a-9=-21a-42$

$33a=-33$

$\boxed{a=-1}$

⑩ $5a+2x=3c$

$2x=3c-5a$

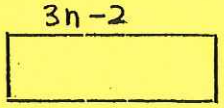
$\boxed{x=\frac{3c-5a}{2}}$

⑪ $4n-8=-20$

$4n=-12$

$\boxed{n=-3}$

⑫



$2n+2(3n-2)=20$

$2n+6n-4=20$

$8n-4=20$

$8n=24$

$n=3$

$\boxed{3 \text{ by } 7 \text{ inches}}$

⑬ -7 n

-5 $n+2$

$\rightarrow \boxed{-3}$ $n+4$

$(n+4)-2n=(n+2)+16$

$-n+4=n+18$

$-2n=14$

$n=-7$

⑭ $\frac{\text{part}}{\text{whole}}$ $\frac{8}{40}=\frac{n}{100}$

$40n=800$

$n=5$ $\boxed{5\%}$

⑮ $\frac{\text{part}}{\text{whole}}$ $\frac{n}{80}=\frac{2.25}{100}$

$100n=180$

$n=\boxed{1.8}$

⑯ $\frac{\text{part}}{\text{whole}}$ $\frac{32.4}{n}=\frac{60}{100}$

$60n=3240$

$n=\boxed{\$54}$

⑰ $\frac{\text{purch pr}}{\text{org pr}}$ $\frac{15.30}{n}=\frac{85}{100}$

$85n=1530$

$n=\boxed{\$18}$

⑱ $3(310)+.06n=1122$

$930+.06n=1122$

$.06n=192$

$n=\boxed{\$3200}$

⑲ $2a+bx=7-cx$

$bx+cx=7-2a$

$x(b+c)=7-2a$

$\boxed{x=\frac{7-2a}{b+c} \text{ for } b+c\neq 0}$

⑳ -6 n

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

-4 $n+2$

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

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

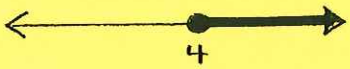
$-n=6$ $n=-6$

3.1
Answer Key

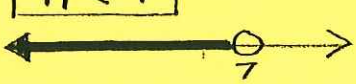
① $3n-2<2(n-3)$
$3n-2<2n-6$
$\boxed{n<-4}$

② $4(2x-1)\geq 6x-10$
$8x-4\geq 6x-10$
$2x\geq -6$
$\boxed{x\geq -3}$

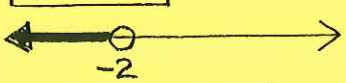
③ $3x+5\geq 35-2(2x+1)$
$3x+5\geq 35-4x-2$
$3x+5\geq 33-4x$
$7x\geq 28$
$\boxed{x\geq 4}$



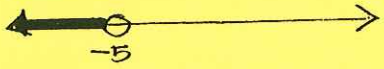
④ $4n-19<57-3(3n-5)$
$4n-19<57-9n+15$
$4n-19<72-9n$
$13n<91$
$\boxed{n<7}$



⑤ $3a+4>5(a+3)-7$
$3a+4>5a+15-7$
$3a+4>5a+8$
$-2a>4$ sign flip
$a<-2$
$\boxed{a<-2}$



⑥ $4x+9>3(2x+4)+7$
$4x+9>6x+12+7$
$4x+9>6x+19$
$-2x>10$ ← sign flip
$\boxed{x<-5}$



⑦ $2a+\frac{4a}{3}\leq 3(2a+1)+5$
$2a+\frac{4a}{3}\leq 6a+3+5$
$\left[2a+\frac{4a}{3}\leq 6a+8\right]3$
$6a+4a\leq 18a+24$
$10a\leq 18a+24$
$-8a\leq 24$
$\boxed{a\geq -3}$

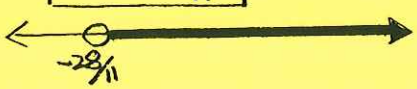
⑧ $3n-\frac{n}{2}\geq 2(2n-5)+4$
$3n-\frac{n}{2}\geq 4n-10+4$
$\left[3n-\frac{n}{2}\geq 4n-6\right]2$
$6n-n\geq 8n-12$
$5n\geq 8n-12$
$-3n\geq -12$
$\boxed{n\leq 4}$

⑨ $\frac{2(n+3)}{5}>\frac{2+n}{-3}$

$\frac{2n+6}{5}>\frac{-2-n}{3}$

negative must be removed from the denominator before cross multiplying an inequality

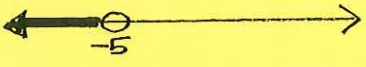
$3(2n+6)>5(-2-n)$
$6n+18>-10-5n$
$\boxed{n>\frac{-28}{11}}$



⑩ $\frac{x-3}{6}>\frac{2(x+3)}{3}$

$\frac{x-3}{6}>\frac{2x+6}{3}$

$3(x-3)>6(2x+6)$
$3x-9>12x+36$
$-9x>45$
$\boxed{x<-5}$



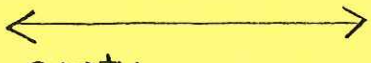
⑪ $\frac{2a}{3}-a\geq 3(4a-1)$
$3\left[\frac{2a}{3}-a\geq 12a-3\right]$
$2a-3a\geq 36a-9$
$-a\geq 36a-9$
$-37a\geq -9$
$\boxed{a\leq 9/37}$

⑫ $12-\frac{5n}{4}<2(5n-1)$
$4\left[12-\frac{5n}{4}<10n-2\right]$
$48-5n<40n-8$
$-45n<-56$
$\boxed{n>56/45}$

⑬ $\frac{3(x-2)}{2}>\frac{6x}{4}$

$\frac{3x-6}{2}>\frac{6x}{4}$

$4(3x-6)>2(6x)$
$12x-24>12x$
$-24>0$
false inequality
$\boxed{\text{no solutions}}$



empty number line

3.2
Answer Key

① $-3 > x$ and $x > -7$

$\boxed{-7 < x < -3}$

② $p > \frac{3}{4}$ and $p \leq 11/9$

$\boxed{3/4 < p \leq 11/9}$

③ $y \leq 4/9$ and $y \geq \frac{-4}{3}$

$\boxed{-4/3 \leq y \leq 4/9}$

④ $m < \frac{-6}{5}$ and $m > \frac{-4}{3}$

$\boxed{-13/7 < m < \frac{-6}{5}}$

⑤ $r > 2$ or $r \leq -2$

union

⑥ $x > -5$ and $x < 0$

intersection

⑦ $-3 < n < 3$

intersection

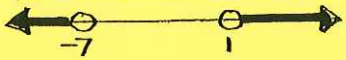
⑧ $d \geq 0$ or $d < 4$

union

all points on the number line are either less than 4 or greater than (or equal to) 0

⑨ $3 + x < -4$ or $3 + x > 4$

$\boxed{x < -7 \text{ or } x > 1}$



⑩ $-1 + b > -4$ or $-1 + b < 3$

$b > -3$ or $b < 4$

$\boxed{\text{all solutions}}$

⑪ $-5 < 4 - 3x < 13$

$-5 < 4 - 3x$ and $4 - 3x < 13$

$-9 < -3x$ and $-3x < 9$

$3 > x$ and $x > -3$

$\boxed{-3 < x < 3}$

⑫ $-3 - x \leq 2x \leq 3 + x$

$-3 - x \leq 2x$ and $2x \leq 3 + x$

$-3 \leq 3x$ and $x \leq 3$

$-1 \leq x$ and $x \leq 3$

$\boxed{-1 \leq x \leq 3}$

⑬ $2x - 1 \leq 2x + 8 < 2x + 4$

$2x - 1 \leq 2x + 8$ and $2x + 8 < 2x + 4$

$-1 \leq 8$ and $8 < 4$

true false

$\boxed{\text{no solutions}}$

the intersection of an identity and a false inequality is the null set (no solutions)

⑭ $n - 1 < 2n + 3 \leq n + 4$

$n - 1 < 2n + 3$ and $2n + 3 \leq n + 4$

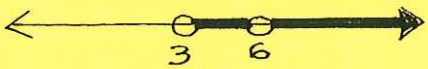
$-4 < n$ and $n \leq 1$

$\boxed{-4 < n \leq 1}$

⑮ $x \neq 6$ and $3x + 1 > 10$

$x \neq 6$ and $3x > 9$

$\boxed{x \neq 6 \text{ and } x > 3}$



⑯ $2x + 4 \leq 6$ or $x \geq 2x - 4$

$2x \leq 2$ or $-x \geq -4$

$x \leq 1$ or $\boxed{x \leq 4}$

all points ≤ 1 are also ≤ 4; since this is a union, only $x \leq 4$ is needed to indicate the answer

⑰ intersection

$-2 < x \leq 3$

⑱ union

$x \leq -4$ or $x > 2$

⑲ intersection

$x \geq 0$ and $x \neq 2$

⑳ intersection

$-5 < x < 1$

⑭ $\frac{1-n}{-5} \leq \frac{2(n-1)}{10}$

$\frac{n-1}{5} \leq \frac{2n-2}{10}$

negative must be removed from denominator before cross multiplying an inequality

$10(n-1) \leq 5(2n-2)$

$10n - 10 \leq 10n - 10$

$-10 \leq -10$

identity

$\boxed{\text{all solutions}}$

3.3
Answer Key

① n = number of papers to be delivered

$.15n \geq 5.30$

$n \geq 35.\overline{3}$

at least 36 papers

② n = number of two-volume sets sold

$4.30n \geq 175$

$n \geq 40.697...$

at least 41 sets

③ n = amount of sales

$21{,}000 < .06n + 12{,}000 < 27{,}000$

subtract 12,000 from each part of the inequality:

$9{,}000 < .06n < 15{,}000$

divide by .06:

$150{,}000 < n < 250{,}000$

between $150,000 and $250,000

④ n = an integer

$13 < 4n + 3 < 25$

subtract 3:

$10 < 4n < 22$

divide by 4:

$\frac{5}{2} < n < \frac{11}{2}$

$n =$ **3, 4, 5**

⑤

n	7	5	3	1
$n+2$	9	7	5	3

$(n)+(n+2) \leq 18$

$2n+2 \leq 18$

$2n \leq 16$

$n \leq 8$

highest odd value for n is 7

4 sets of integers (positive, odd)

⑥

n	10	8	6	4	2
$n+2$	12	10	8	6	4

$(n)+(n+2) \leq 22$

$2n+2 \leq 22$

$2n \leq 20$

$n \leq 10$

highest even value for $n = 10$

5 set of integers (pos, even)

⑦ $2 - \frac{2n}{3} < 3(3n-1)$

$3\left[2 - \frac{2n}{3} < 9n - 3\right]$

$6 - 2n < 27n - 9$

$-29n < -15$

$n > \frac{15}{29}$

⑧ $\frac{2(3x-4)}{3} \geq \frac{4x-1}{2}$

$\frac{6x-8}{3} \geq \frac{4x-1}{2}$

$2(6x-8) \geq 3(4x-1)$

$12x - 16 \geq 12x - 3$

$-16 \geq -3$ false inequality

no solutions

⑨ $3 - 2x < 5$ or $3x - 1 > -10$

$-2x < 2$ or $3x > -9$

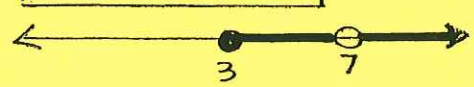
$x > -1$ or $x > -3$ union

since this is a union, all values greater than −3 include all possible solutions

⑩ $5n + 2 \geq 17$ and $n \neq 7$

$5n \geq 15$ and $n \neq 7$

$n \geq 3$ and $n \neq 7$

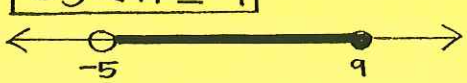


⑪ $n - 4 < 2n + 1 \leq n + 10$

$n - 5 < 2n \leq n + 9$

subtract 1
subtract n

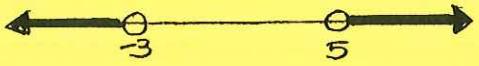
$-5 < n \leq 9$



⑫ $2a+1>11$ or $3a<a-6$

$2a>10$ or $2a<-6$

$\boxed{a>5 \text{ or } a<-3}$



⑬ $x<-3$ or $x>4$

union

⑭ $-4\leq x<0$

intersection

⑮ $x>-2$ and $x\neq 6$

intersection

⑯ $-5\leq x\leq 4$

intersection

3.4

Answer Key

① $|x+4|=6$

$x+4=6$ or $x+4=-6$

$\boxed{x=2 \text{ or } x=-10}$

② $|y+1|=5$

$y+1=5$ or $y+1=-5$

$\boxed{y=4 \text{ or } y=-6}$

③ $|x|+7=12$

$|x|=5$

$\boxed{x=5 \text{ or } x=-5}$

④ $|n|-4=3$

$|n|=7$

$\boxed{n=7 \text{ or } n=-7}$

⑤ $|y-1|<4$

$y-1<4$ and $y-1>-4$

$y<5$ and $y>-3$

$\boxed{-3<y<5}$

⑥ $|2-x|\leq 1$

$2-x\leq 1$ and $2-x\geq -1$

$-x\leq -1$ and $-x\geq -3$

$x\geq 1$ and $x\leq 3$

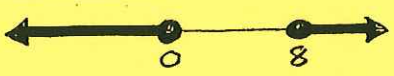
$\boxed{1\leq x\leq 3}$

⑦ $|12-3x|\geq 12$

$12-3x\geq 12$ or $12-3x\leq -12$

$-3x\geq 0$ or $-3x\leq -24$

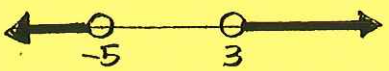
$\boxed{x\leq 0 \text{ or } x\geq 8}$



⑧ $|y+1|>4$

$y+1>4$ or $y+1<-4$

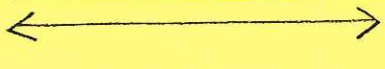
$\boxed{y>3 \text{ or } y<-5}$



⑨ $|x-3|+5\leq 2$

$|x-3|\leq -3$

$\boxed{\text{no solutions}}$



an absolute value cannot be negative

⑩ $|n+3|+7>5$ — an absolute value must be greater than a negative

$|n+3|>-2$

all solutions

⑪ $|4x+4|+2 \le 22$

$|4x+4| \le 20$

$4x+4 \le 20$ and $4x+4 \ge -20$

$4x \le 16$ and $4x \ge -24$

$x \le 4$ and $x \ge -6$

$\boxed{-6 \le x \le 4}$

⑫ $|6x+6|-3 \le 33$

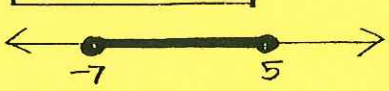
$|6x+6| \le 36$

$6x+6 \le 36$ and $6x+6 \ge -36$

$6x \le 30$ and $6x \ge -42$

$x \le 5$ and $x \ge -7$

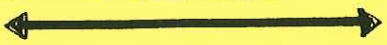
$\boxed{-7 \le x \le 5}$



⑬ $|2x+1|+3 \ge 1$ — absolute value must be greater than a negative

$|2x+1| \ge -2$

all solutions



⑭ $|10x+10|-1 \ge 89$

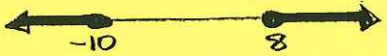
$|10x+10| \ge 90$

$10x+10 \ge 90$ or $10x+10 \le -90$

$10x \ge 80$ or $10x \le -100$

$x \ge 8$ or $x \le -10$

$\boxed{x \ge 8 \text{ or } x \le -10}$



⑮ $3n+1<4$ or $2n-1 \ge 7$

$3n<3$ or $2n \ge 8$

$\boxed{n<1 \text{ or } n \ge 4}$ union

⑯ $3x-2 \le 5x+4 < 3x+12$ and $x \ne 0$

$3x-6 \le 5x < 3x+8$ subtract 4

$-6 \le 2x < 8$ subtract $3x$

$-3 \le x < 4$ divide by 2

$\boxed{-3 \le x < 4 \text{ and } x \ne 0}$

intersection

⑰ n = the integer

$22 \le 5n-7 \le 34$

$29 \le 5n \le 41$

$\frac{29}{5} \le n \le \frac{41}{5}$

$n = \boxed{6, 7, 8}$

⑱

n	-3	-1	1	3	5
$n+2$	-1	1	3	5	7

$-5 < (n)+(n+2) < 13$

$-5 < 2n+2 < 13$

$-7 < 2n < 11$

$-\frac{7}{2} < n < \frac{11}{2}$

consecutive odd integers

n must be an odd integer between $-3\frac{1}{2}$ and $5\frac{1}{2}$

3.5

Answer Key

① $|4n-2|-1<9$

$|4n-2|<10$

$4n-2<10$ and $4n-2>-10$

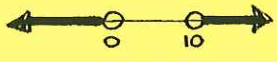
$4n<12$ and $4n>-8$

$n<3$ and $n>-2$ $\boxed{-2<n<3}$

② $|x-5|-3>2$ $|x-5|>5$

$x-5>5$ or $x-5<-5$

$\boxed{x>10 \text{ or } x<0}$

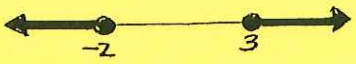


③ $|2n-1| \geq 5$

$2n-1 \geq 5$ or $2n-1 \leq -5$

$2n \geq 6$ or $2n \leq -4$

$\boxed{n \geq 3 \text{ or } n \leq -2}$



④ $|3y+2| \leq 5$

$3y+2 \leq 5$ and $3y+2 \geq -5$

$3y \leq 3$ and $3y \geq -7$

$y \leq 1$ and $y \geq -\frac{7}{3}$

$\boxed{-\frac{7}{3} \leq y \leq 1}$

⑤ $|4-2x|+3 \leq 2$

$|4-2x| \leq -1$

$\boxed{\text{no solutions}}$

absolute value must be positive or zero

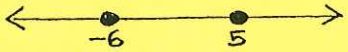
⑥ $|2n+1|-3=8$

$|2n+1|=11$

$2n+1=11$ or $2n+1=-11$

$2n=10$ or $2n=-12$

$\boxed{n=5 \text{ or } n=-6}$



⑦ $|4x|-2=6$

$|4x|=8$

$4x=8$ or $4x=-8$

$\boxed{x=2 \text{ or } x=-2}$

⑧ $|3n-2|+4>2$

$|3n-2|>-2$

$\boxed{\text{all solutions}}$

absolute value must be greater than or equal to zero, all values of n will work in this inequality

⑨ $\frac{3(n-3)}{4} < \frac{n-6}{-2}$

$\frac{3n-9}{4} < \frac{6-n}{2}$

negative must be removed from denominator before cross multiplying an inequality

$2(3n-9) < 4(6-n)$

$6n-18 < 24-4n$

$10n < 42$

$\boxed{n < 21/5}$

⑩ $x \geq -8$ and $x < 0$

$\boxed{-8 \leq x < 0}$

⑪ union

$\boxed{x < -2 \text{ or } x \geq 1}$

⑫ intersection

$\boxed{-2 \leq x < 5 \text{ and } x \neq 3}$

⑬ $2n-1 < 3n+6 < 2n+8$ and $n \neq -2$

$2n-7 < 3n < 2n+2$ subtract 6

$-7 < n < 2$ subtract $2n$

$\boxed{-7 < n < 2 \text{ and } n \neq -2}$

⑭ n = sales for the year

$21{,}600 < .05n + 18{,}000 < 24{,}500$

$3600 < .05n < 6500$

divide by .05

$72{,}000 < n < 130{,}000$

$\boxed{\text{between \$72,000 and \$130,000}}$

⑮ n = the integer

$21 \leq 3n-4 \leq 37$

$25 \leq 3n \leq 41$

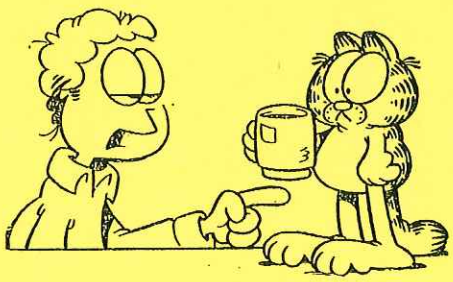
$\frac{25}{3} \leq n \leq \frac{41}{3}$

n is between $8\frac{1}{3}$ and $13\frac{2}{3}$

There are five values for n

$\boxed{9, 10, 11, 12, 13}$

Unit 3
REVIEW
Answer Key



① $4(n-3) \leq 2(3n-5)-6$

$4n-12 \leq 6n-10-6$

$4n-12 \leq 6n-16$

$-2n \leq -4$

$\boxed{n \geq 2}$

② $3(2x+1) > 4(3+3x)+3$

$6x+3 > 12+12x+3$

$6x+3 > 15+12x$

$-6x > 12$

$\boxed{x < -2}$

③ $4a+\frac{a}{3} \geq 2(a-5)-4$

$3\left[4a+\frac{a}{3} \geq 2a-14\right]$

$12a+a \geq 6a-42$

$7a \geq -42$

$\boxed{a \geq -6}$

④ $\frac{2n}{5}+1<3(n-5)-n$

$\frac{2n}{5}+1<3n-15-n$

$5\left[\frac{2n}{5}+1<2n-15\right]$

$2n+5<10n-75$

$-8n<-80$

$\boxed{n>10}$

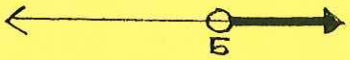
⑤ $\frac{2(x+4)}{3}>\frac{x+7}{2}$

$\frac{2x+8}{3}>\frac{x+7}{2}$

$2(2x+8)>3(x+7)$

$4x+16>3x+21$

$\boxed{x>5}$



⑥ $\frac{-2(n+5)}{8}\leq\frac{4-3n}{-7}$

$\frac{-2n-10}{8}\leq\frac{3n-4}{7}$

negative must be removed from the denominator before cross multiplying an inequality

$7(-2n-10)\leq 8(3n-4)$

$-14n-70\leq 24n-32$

$-38n\leq 38$

$\boxed{n\geq -1}$

⑦ $2(3n+5)<3(2n-1)$

$6n+10<6n-3$

$10<-3$

false inequality

$\boxed{\text{no solutions}}$

⑧ $n-3\geq 4n-3(n+1)$

$n-3\geq 4n-3n-3$

$n-3\geq n-3$

$-3\geq -3$ identity

$\boxed{\text{all solutions}}$

⑨ $-2<n$ and $4>n$

$\boxed{-2<n<4}$

⑩ $x\geq\frac{-2}{3}$ and $x<\frac{1}{2}$

$\boxed{-\frac{2}{3}\leq x<\frac{1}{2}}$

⑪ $2n-1>5$ or $4-3n>-2$

$2n>6$ or $-3n>-6$

$\boxed{n>3 \text{ or } n<2}$

⑫ $4(x+1)\geq -8$ or $9-5x<-1$

$4x+4\geq -8$ or $-5x<-10$

$4x\geq -12$ or $x>2$

$x\geq -3$ or $x>2$

$\boxed{x\geq -3}$

⑬ $3n+4<3n-2<3n+1$

subtract $3n$ from all parts:

$4<-2<1$

false inequality

$\boxed{\text{no solutions}}$

⑭ $n-5\leq 2n+1\leq n+4$

$n-6\leq 2n\leq n+3$

subtract 1 ↓

subtract n ↓

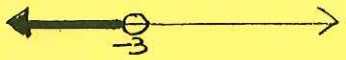
$\boxed{-6\leq n\leq +3}$

⑮ $3a+4<-5$ and $-2a>4$

$3a<-9$ and $a<-2$

$a<-3$ and $a<-2$

$\boxed{a<-3}$



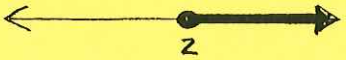
⑯ $4x\geq 2x+4$ and $-3(2x-1)\leq 3$

$2x\geq 4$ and $-6x+3\leq 3$

$x\geq 2$ and $-6x\leq 0$

$x\geq 2$ and $x\geq 0$

$\boxed{x\geq 2}$



⑰ $3n-1<4n+4<2n+8$

subtract 4

$3n-5<4n<2n+4$

$3n-5<4n$ and $4n<2n+4$

$-5<n$ and $2n<4$

$-5<n$ and $n<2$

$\boxed{-5<n<2}$

⑱ $2x-2>4$ or $3x-1<14$

$2x>6$ or $3x<15$

$x>3$ or $x<5$

all values of x are either greater than 3 or less than 5

$\boxed{\text{all solutions}}$

⑲ $x-1\leq 2x<x+4$ and

subtract x $x\neq 0$

$\boxed{-1\leq x<4 \text{ and } x\neq 0}$

(20) $3x-1 \le 11$ and $x \neq -2$

$3x \le 12$ and $x \neq -2$

$\boxed{x \le 4 \text{ and } x \neq -2}$

(21) $-4 < x \le 3$

intersection

(22) $x < -4$ or $x > 2$

union

(23) $x \le 3$ and $x \neq -1$

intersection

(24) $-5 < x < 4$ and $x \neq 2$

intersection

(25) n = the integer

$17 < 2n+4 < 27$

subtract 4

$13 < 2n < 23$

divide by 2

$\frac{13}{2} < n < \frac{23}{2}$

n is between $6\frac{1}{2}$ and $11\frac{1}{2}$

$\boxed{7, 8, 9, 10, 11}$

(26) n = the integer

$-9 < 3n-4 < 1$

add 4

$-5 < 3n < 5$

divide by 3

$\frac{-5}{3} < n < \frac{5}{3}$

n is between $-1\frac{2}{3}$ and $1\frac{2}{3}$

$\boxed{-1, 0, 1}$

(27) n = sales

$16{,}400 < 15{,}200 + .06n < 18{,}200$

subtract 15,200

$1200 < .06n < 3000$

divide by .06

$20{,}000 < n < 50{,}000$

$\boxed{\text{between } \$20{,}000 \text{ and } \$50{,}000}$

(28) n = sales

$12{,}780 < 11{,}100 + .07n < 16{,}280$

subtract 11,100

$1680 < .07n < 5180$

divide by .07

$24{,}000 < n < 74{,}000$

$\boxed{\text{between } \$24{,}000 \text{ and } \$74{,}000}$

(29)

n	5	6	7
$n+1$	6	7	8
$n+2$	7	8	9

$17 \le (n) + (n+1) + (n+2) \le 26$

$17 \le 3n+3 \le 26$

subtract 3

$14 \le 3n \le 23$

divide by 3

$\frac{14}{3} \le n \le \frac{23}{3}$

n is between $4\frac{2}{3}$ and $7\frac{2}{3}$

(30)

n	-2	0	2	4
$n+2$	0	2	4	6
$n+4$	2	4	6	8

$-1 \le (n) + (n+2) + (n+4) \le 20$

$-1 \le 3n+6 \le 20$

subtract 6

$-7 \le 3n \le 14$

divide by 3

$\frac{-7}{3} \le n \le \frac{14}{3}$

$-2\frac{1}{3} \le n \le 4\frac{2}{3}$

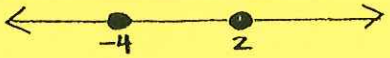
n is even and n is between $-2\frac{1}{3}$ and $4\frac{2}{3}$

(31) $|n+1|+4=7$

$|n+1|=3$

$n+1=3$ or $n+1=-3$

$\boxed{n=2 \text{ or } n=-4}$



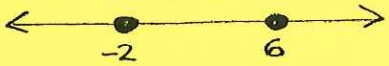
(32) $|2x-4|-3=5$

$|2x-4|=8$

$2x-4=8$ or $2x-4=-8$

$2x=12$ or $2x=-4$

$\boxed{x=6 \text{ or } x=-2}$



(33) $|3a-2|+4<3$

$|3a-2|<-1$

an absolute value must be greater than or equal to 0

$\boxed{\text{no solutions}}$

(34) $|2n+3|+4 \geq 2$

$|2n+3| \geq -2$

an absolute value must be greater than or equal to 0

$\boxed{\text{all solutions}}$

(35) $|a+4|>2$

$a+4>2$ or $a+4<-2$

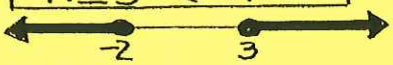
$\boxed{a>-2 \text{ or } a<-6}$

(36) $|2n-1| \geq 5$

$2n-1 \geq 5$ or $2n-1 \leq -5$

$2n \geq 6$ or $2n \leq -4$

$\boxed{n \geq 3 \text{ or } n \leq -2}$



(37) $|x-6|-2 \leq 10$

$|x-6| \leq 12$

$x-6 \leq 12$ and $x-6 \geq -12$

$x \leq 18$ and $x \geq -6$

$\boxed{-6 \leq x \leq 18}$

(38) $|2a+4|+1<13$

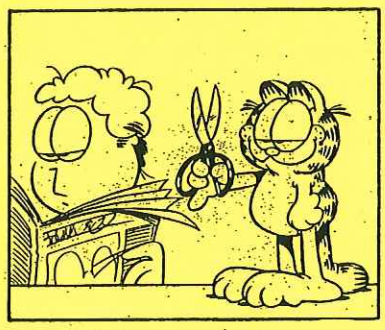
$|2a+4|<12$

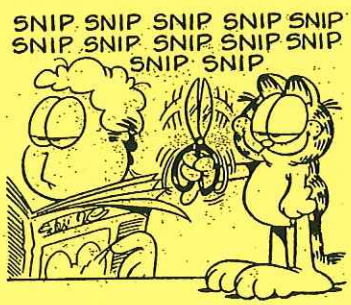
$2a+4<12$ and $2a+4>-12$

$2a<8$ and $2a>-16$

$a<4$ and $a>-8$

$\boxed{-8<a<4}$



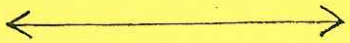


Unit 3

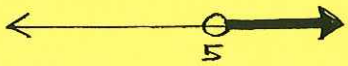
SKILL CHECK - ANSWER KEY

① $3(n-1) > 4n-7$
$3n-3 > 4n-7$
$-n > -4$
$\boxed{n<4}$

② $\frac{n}{2}+4 \le 2(n-1)-\frac{3n}{2}$
$2\left[\frac{n}{2}+4 \le 2n-2-\frac{3n}{2}\right]$
$n+8 \le 4n-4-3n$
$n+8 \le n-4$
$8 \le -4$ false ineq.
$\boxed{\text{no solutions}}$



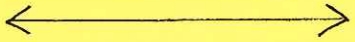
③ $\frac{2(x+1)}{3} < \frac{3x+1}{4}$
$\frac{2x+2}{3} < \frac{3x+1}{4}$
$4(2x+2) < 3(3x+1)$
$8x+8 < 9x+3$
$-x < -5$
$\boxed{x>5}$



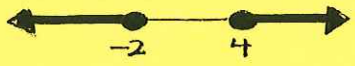
④ $2a<6$ and $3a \ge -9$
$a<3$ and $a \ge -3$
$\boxed{-3 \le a < 3}$

⑤ $3n-5 < 4n+6 < 2n+8$
subtract 6
$3n-11 < 4n < 2n+2$
$3n-11 < 4n$ and $4n < 2n+2$
$-11 < n$ and $2n < 2$
$-11 < n$ and $n < 1$
$\boxed{-11 < n < 1}$

⑥ $4(x+4) \le 4x+8 \le 2(2x+5)$
$4x+16 \le 4x+8 \le 4x+10$
Subtract $4x$
$16 \le 8 \le 10$
false inequality
$\boxed{\text{no solutions}}$



⑦ $3n+4 \le -2$ or $2n-5 \ge 3$
$3n \le -6$ or $2n \ge 8$
$\boxed{n \le -2 \text{ or } n \ge 4}$



⑧ $n<-1$ or $n>8$
union

⑨ n = an even integer
$-12 < 4n-3 < 7$
add 3
$-9 < 4n < 10$
divide by 4
$\frac{-9}{4} < n < \frac{10}{4}$
n is between $-2\frac{1}{4}$ and $2\frac{1}{2}$
$n = \boxed{-2, 0, 2}$

⑩ n = sales
$16{,}960 < 16{,}000 + .08n < 21{,}600$
$960 < .08n < 5{,}600$
$12{,}000 < n < 70{,}000$
$\boxed{\text{between } \$12{,}000 \text{ and } \$70{,}000}$

⑪

n	5	7	9
$n+2$	7	9	11

$2 \le 2n-(n+2) \le 8$
$2 \le 2n-n-2 \le 8$
$2 \le n-2 \le 8$
$4 \le n \le 10$
n is odd = 5, 7, 9

⑫ $x-3 \le 3x+5 \le 2x+8$
$x-8 \le 3x \le 2x+3$
$x-8 \le 3x$ and $3x \le 2x+3$
$-8 \le 2x$ and $x \le 3$
$\boxed{-4 \le x \le 3 \text{ and } x \ne -1}$

⑬ $|2n-4|-2 \ge 4$
$|2n-4| \ge 6$
$2n-4 \ge 6$ or $2n-4 \le -6$
$2n \ge 10$ or $2n \le -2$
$\boxed{n \ge 5 \text{ or } n \le -1}$

⑭ $|3x+2|+4 < 10$
$|3x+2| < 6$
$3x+2 < 6$ and $3x+2 > -6$
$3x < 4$ and $3x > -8$
$\boxed{\frac{-8}{3} < x < \frac{4}{3}}$

Unit 3
REMEDIATION - ANSWER KEY

① $2(a-3) \le 5a-3$
$2a-6 \le 5a-3$
$-3a \le 3$
$\boxed{a \ge 1}$

② $\left[\frac{2n}{3} - 1 > n-4\right] 3$
$2n-3 > 3n-12$
$-n > -9$ $\boxed{n < 9}$

③ $\frac{3(2n+2)}{2} > \frac{6n-7}{2}$

$\frac{6n+6}{2} > \frac{6n-7}{2}$

$2(6n+6) > 2(6n-7)$
$12n+12 > 12n-14$
$12 > -14$ identity
$\boxed{\text{all solutions}}$

④ $5n-1 \le 14$ and $2n+3 > -1$
$5n \le 15$ and $2n > -4$
$n \le 3$ and $n > -2$
$\boxed{-2 < n \le 3}$

⑤ $2x-6 \le 3x+4 < x+12$
subtract 4
$2x-10 \le 3x < x+8$
$2x-10 \le 3x$ and $3x < x+8$
$-10 \le x$ and $2x < 8$
$-10 \le x$ and $x < 4$
$\boxed{-10 \le x < 4}$

⑥ $2(4n-1) < 8n+5 < 4(2n+3)$
$8n-2 < 8n+5 < 8n+12$
$-2 < 5 < 12$ identity
$\boxed{\text{all solutions}}$

⑦ $3a+1 < -5$ or $2a+6 < 3a-2$
$3a < -6$ or $-a < -8$
$\boxed{a < -2 \text{ or } a > 8}$

⑧ $-4 < n \le 0$
intersection

⑨ n = odd integer
$-4 \le 2n+3 \le 10$
$-7 \le 2n \le 7$
$-\frac{7}{2} \le n \le \frac{7}{2}$
$n = \boxed{-3, -1, 1, 3}$

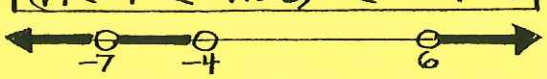
⑩ n = total sales
$16,820 < 12,500 + .12n < 25,460$
$4320 < .12n < 12,960$
$36,000 < n < 108,000$
$\boxed{\begin{array}{l}\text{between} \\ \$36,000 \text{ and } \$108,000\end{array}}$

⑪

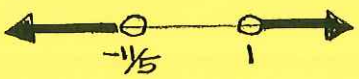
n	-6	-4	-2	0
$n+2$	-4	-2	0	2
$n+4$	-2	0	2	4

$-10 < (n+2) + 2(n+4) < 12$
$-10 < 3n+10 < 12$
$-20 < 3n < 2$
$-\frac{20}{3} < n < \frac{2}{3}$
n is even
$-6, -4, -2, 0$

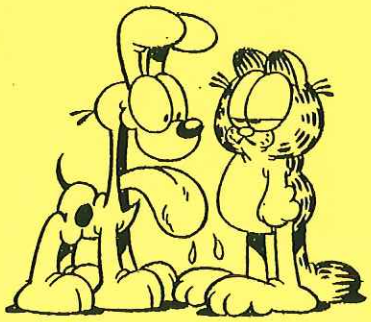
⑫ $[3n < n-8$ or $2n > n+6]$ and $n \ne -7$
$(2n < -8$ or $n > 6)$ and $n \ne -7$
$\boxed{(n < -4 \text{ or } n > 6) \text{ and } n \ne -7}$



⑬ $|5x+3| - 1 > 7$
$|5x+3| > 8$
$5x+3 > 8$ or $5x+3 < -8$
$5x > 5$ or $5x < -11$
$\boxed{x > 1 \text{ or } x < -11/5}$



⑭ $|2n-5| + 3 \le 6$
$|2n-5| \le 3$
$2n-5 \le 3$ and $2n-5 \ge -3$
$2n \le 8$ and $2n \ge 2$
$\boxed{1 \le n \le 4}$



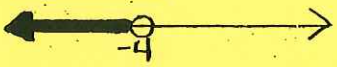
Unit 3

EXTRA PRACTICE - ANSWER KEY

① $2(4a-6)<-6$
$8a-12<-6$
$8a<6$
$\boxed{a<3/4}$

② $-3(x-2)\geq 2(x-1)+3$
$-3x+6\geq 2x-2+3$
$-3x+6\geq 2x+1$
$-5x\geq -5$
$\boxed{x\leq 1}$

③ $2(n+3)<\frac{n}{4}-1$
$4[2n+6<\frac{n}{4}-1]$
$8n+24<n-4$
$7n<-28$
$\boxed{n<-4}$

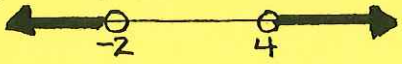


④ $-3(3x+2)\geq 2(x-3)-11x$
$-9x-6\geq 2x-6-11x$
$-6\geq -6$ identity
$\boxed{\text{all solutions}}$

⑤ $\frac{2n+7}{3}\geq\frac{3(3n-2)}{6}$
$6(2n+7)\geq 9(3n-2)$
$12n+42\geq 27n-18$
$-15n\geq -60$
$\boxed{n\leq 4}$

⑥ $x>-2$ and $x<4$
$\boxed{-2<x<4}$

⑦ $3x-2<-8$ or $x-7>-3$
$3x<-6$
$\boxed{x<-2 \text{ or } x>4}$

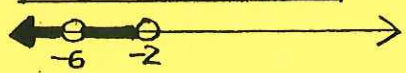


⑧ $x+4\leq 2x+9\leq x+15$
$4\leq x+9\leq 15$
$\boxed{-5\leq x\leq 6}$

⑨ $6n+5<2(3n+4)<3(2n-1)$
$6n+15<6n+8<6n-3$
$15<18<-3$
$\boxed{\text{no solutions}}$

⑩ $x\geq 4x-9$ or $2x\geq x+4$
$-3x\geq -9$ or $x\geq 4$
$\boxed{x\leq 3 \text{ or } x\geq 4}$

⑪ $n-8>3n-4$ and $n\neq -6$
$-2n>4$
$\boxed{n<-2 \text{ and } n\neq -6}$



⑫ $\boxed{\text{union}}$
$\boxed{x<-2 \text{ or } x>4}$

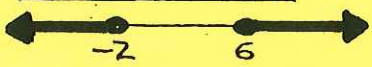
⑬ $\boxed{\text{intersection}}$
$\boxed{-7\leq x\leq 1}$

⑭ $12<3n-5<15$
$17<3n<20$
$\frac{17}{3}<n<\frac{20}{3}$
$5\frac{2}{3}<n<6\frac{2}{3}$
integer = $\boxed{6}$

⑮ $6<5n-3<25$
$9<5n<28$
$\frac{9}{5}<n<\frac{28}{5}$
$1\frac{4}{5}<n<5\frac{3}{5}$
$\boxed{2,3,4,5}$

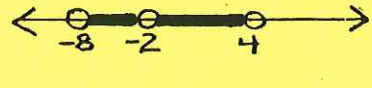
⑯ $21{,}200<14{,}200+.05n<25{,}200$
$7000<.05n<11{,}000$
$140{,}000<n<220{,}000$
$\boxed{\text{between } \$140{,}000 \text{ and } \$220{,}000}$

⑰ $|3x-6|\geq 12$
$3x-6\geq 12$ or $3x-6\leq -12$
$3x\geq 18$ or $3x\leq -6$
$\boxed{x\geq 6 \text{ or } x\leq -2}$



⑱ $|2x+6|-4<6$
$|2x+6|<10$
$2x+6<10$ and $2x+6>-10$
$2x<4$ and $2x>-16$
$x<2$ and $x>-8$
$\boxed{-8<x<2}$

⑲ $x-3<2x+5<x+9$
$-3<x+5<9$ and $x\neq -2$
$\boxed{-8<x<4 \text{ and } x\neq -2}$



⑳ $30<n+4(n+2)<56$
$30<5n+8<56$
$22<5n<48$
$\frac{22}{5}<n<\frac{48}{5}$
$4\frac{2}{5}<n<9\frac{3}{5}$
$\boxed{5,7 \\ 7,9 \\ 9,11}$

Cumulative Review

"A"

Cumulative Review Answer Key

① Substitution Property of Equality

② Distributive Property

③ $(2n+3)+(n-5)$

④ $2ab^2 - 3bc$

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

$2(-2)(1) - 3(-1)(3)$

$(-4)-(-9) = (-4)+(9) = \boxed{5}$

⑤ $2b^3 - 3(ac-b)$

$2(-1)^3 - 3[(-2)(3)-(-1)]$

$2(-1) - 3[(-6)+1]$

$(-2) - 3(-5)$

$(-2)-(-15) = (-2)+15 = \boxed{13}$

⑥ $8xy - 3x(2x-4y) - 2x^2$

$8xy - 6x^2 + 12xy - 2x^2$

$\boxed{20xy - 8x^2}$

⑦ $4a(a-2b) - 3b(a+2b) + b^2$

$4a^2 - 8ab - 3ab - 6b^2 + b^2$

$\boxed{4a^2 - 11ab - 5b^2}$

⑧ $\frac{3n-4}{8} = 3n+10$ } mult. by 8

continued

$3n - 4 = 24n + 80$

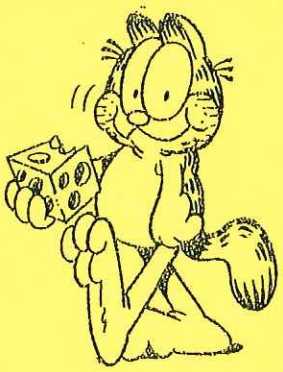
$-21n = 84$ $\boxed{n=-4}$

⑨ $5(3n-2) = 4(n+4) + 3n - 2$

$15n - 10 = 4n + 16 + 3n - 2$

$15n - 10 = 7n + 14$

$8n = 24$ $\boxed{n=3}$



⑩ $\frac{n+5}{3} < \frac{4(3n-1)}{12}$

$\frac{n+5}{3} < \frac{12n-4}{12}$

$12(n+5) < 3(12n-4)$

$12n + 60 < 36n - 12$

$-24n < -72$ $\boxed{n > 3}$

sign flips, multiply by neg.

⑪ $2n - 9 \le 3n - 4 < n + 8$

$2n - 9 \le 3n - 4$ and $3n - 4 < n + 8$

$-5 \le n$ and $2n < 12$

$n < 6$

$\boxed{-5 \le n < 6}$

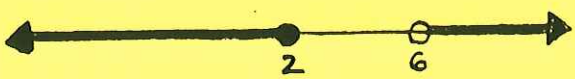
⑫ $2x + 3 \le 7$ or $3(x-4) > 6$

$2x \le 4$ $3x - 12 > 6$

$3x > 18$

$x \le 2$ or $x > 6$

$\boxed{x \le 2 \text{ or } x > 6}$



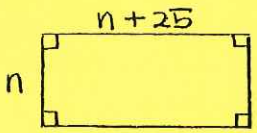
⑬ $3n-2m=mn+4$
$3n-mn=2m+4$
$n(3-m)=2m+4$
$\boxed{n=\frac{2m+4}{3-m} \text{ for } m\neq 3}$

⑭

	now	6 ago	in 2
Mrs. B	$4n$	$4n-6$	
Nick	n		$n+2$

$4n-6=3(n+2)$
$4n-6=3n+6$
$n=12$
$n-1$ (last yr) = $\boxed{11 \text{ yrs old}}$

⑮ $2n+12=3n-31$
$43=n$ $\boxed{43}$

⑯


$2n+2(n+25)=170$
$2n+2n+50=170$
$4n=120$
$n=30$
$n+25=55$
$A=(30)(55)$
$\boxed{1650 m^2}$

⑰ $\frac{\text{part}}{\text{whole}}$ $\frac{85.69}{n}=\frac{104.5}{100}$

$104.5n=8569$
$n=\boxed{\$82}$

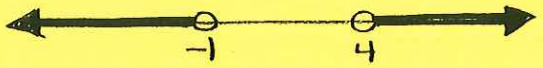
⑱ $\frac{\text{purch pr}}{\text{org pr}}$ $\frac{128}{n}=\frac{80}{100}$

$80n=12{,}800$ $n=\boxed{\$160}$

⑲ $8<3n-2<24$
$10<3n<26$
$\frac{10}{3}<n<\frac{26}{3}$ $\boxed{4, 6, 8}$
$n=$ even, between $3\frac{1}{3}$ and $8\frac{2}{3}$

⑳ $.04n+400=520$
$.04n=120$
$n=3000$ $\boxed{\$3000}$

㉑ $|4n-6|>10$
$4n-6>10$ or $4n-6<-10$
$4n>16$ or $4n<-4$
$\boxed{n>4 \text{ or } n<-1}$



㉒ $|n|-3\leq -4$
$|n|\leq -1$ ← impossible
$\boxed{\text{no solutions}}$

㉓ $|n-5|+3<8$
$|n-5|<5$
$n-5<5$ and $n-5>-5$
$n<10$ and $n>0$
$\boxed{0<n<10}$

"B"

Cumulative Review Answer Key

① Multiplicative Inverse

② Symmetric Property of Equality

③ $(n-3)(n^2+2)$

④ $-x^2-3xy$
$-(-1)^2-3(-1)(4)$
$-(1)-(-12)$
$-1+12$
$\boxed{11}$

⑤ $\frac{2xy^2+8z}{4x^3y} = \frac{2(-1)(4)^2+8(-2)}{4(-1)^3(4)}$

$\frac{(-32)+(-16)}{-16} = \frac{-48}{-16} = \boxed{3}$

⑥ $3x(2y-x)-2x(3x+y)$

$6xy-3x^2-6x^2-2xy$

$\boxed{-9x^2+4xy}$

⑦ $\frac{-12m-20mn}{8m} = \frac{-3-5n}{2}$

divide by 4

⑧ $3(a-4)-5a = a+3$

$3a-12-5a = a+3$

$-2a-12 = a+3$

$-3a = 15$

$\boxed{a=-5}$

⑨ $\left[6-\frac{3n}{2} = 9-2n\right](2)$

$12-3n = 18-4n$

$\boxed{n=6}$

⑩ $4(x-3) \geq 8(x-1)$

$4x-12 \geq 8x-8$

$-4x \geq 4$

$\boxed{x \leq -1}$

⑪ $n+6 < 3n+10 \leq n+16$

$n-4 < 3n \leq n+6$

subtract 10 then subtract n

$-4 < 2n \leq 6$

divide by 2

$\boxed{-2 < n \leq 3}$

⑫ $a-3 \leq 4$ or $3(a-2) < 5a-2$

$a \leq 7$ or $3a-6 < 5a-2$

$-2a < 4$

$a \leq 7$ or $a > -2$

all points are either less than or equal to 7 or greater than -2

$\boxed{\text{all solutions}}$ ⟷

⑬ $4(x-3y) = xy+y^2$

$4x-12y = xy+y^2$

$4x-xy = 12y+y^2$

$x(4-y) = 12y+y^2$

$\boxed{x = \frac{12y+y^2}{4-y} \text{ for } y \neq 4}$

⑭

	now	6 ago	4 ago
Alice	n		n-4
Fay	2n	2n-6	

$2n-6 = 3(n-4)$

$2n-6 = 3n-12$

$-n = -6$

$n = 6 \quad 2n = 12$

$\boxed{\text{Fay is 6 yrs older}}$

⑮

n	-4	
n+2	-2	←
n+4	0	

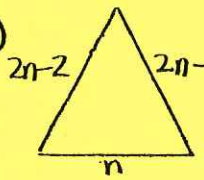
$2n-3(n+2) = -2$

$2n-3n-6 = -2$

$-n = 4$

$n = -4$

⑯



$(2n-2)+(2n-2)+n = 26$

$5n-4 = 26$

$5n = 30$

$n = 6$

$\boxed{6 \text{ in.}}$

⑰ $\frac{\text{part}}{\text{whole}} \quad \frac{n}{140} = \frac{22.5}{100}$

$100n = 3150$

$\boxed{31.5}$

"C"

Cumulative Review Answer Key

(18) $\frac{\text{discount}}{\text{org pr}}$ $\frac{10.80}{n} = \frac{15}{100}$

$15n = 1080$

$n = 72$

$72 - 10.80 =$ **\$61.20**

(19) $-7 < 4n+6 < 19$

$-13 < 4n < 13$

$\frac{-13}{4} < n < \frac{13}{4}$

$n =$ **$-3, -1$**

(20) $.05n + 3(225) = 815$

$.05n + 675 = 815$

$.05n = 140$

$n =$ **\$2800**

(21) $|6x-6| - 2 \leq 16$

$|6x-6| \leq 18$

$6x-6 \leq 18$ and $6x-6 \geq -18$

$6x \leq 24$ and $6x \geq -12$

$x \leq 4$ and $x \geq -2$

$-2 \leq x \leq 4$

(22) $|n-1| + 4 > 2$

$|n-1| > -2$

absolute value must be greater than or = 0

all solutions

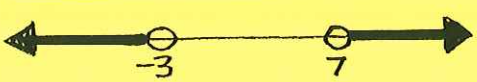
(23) $|3n-6| > 15$

$3n-6 > 15$ or $3n-6 < -15$

$3n > 21$ or $3n < -9$

$n > 7$ or $n < -3$

$n > 7$ or $n < -3$



① Commutative Property of Addition

② Additive Inverse

③ $n^3 - (4n-3)$

④ $abc - 2bc^3$

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

$(4) - 2(-2)(-1)$

$(4) - (4) =$ **0**

⑤ $4bc - 2(ab^2 - 1)$

$4(-2)(-1) - 2[(-2)(-2)^2 - 1]$

$(8) - 2(7)$

$(8) - (14) =$ **-6**

⑥ $4ab - 2a(3a-b) - 5a^2$

$4ab - 6a^2 + 2ab - 5a^2$

$6ab - 11a^2$

⑦ $3x(2x-y) - 4x^2 - 3(x^2 - xy)$

$6x^2 - 3xy - 4x^2 - 3x^2 + 3xy$

$-x^2$

⑧ $\left[\frac{2(n-5)}{3} - n = 3n\right](3)$

$2n - 10 - 3n = 9n$

$-10 = 10n$ **$n = -1$**

⑨ $\left[2(3x-4) - 2x = \frac{x-2}{3}\right](3)$

$\left[6x - 8 - 2x = \frac{x-2}{3}\right](3)$

$12x - 24 = x - 2$

$11x = 22$ **$x = 2$**

(10) $\frac{2(n-3)}{6} > \frac{4n-4}{9}$

$9(2n-6) > 6(4n-4)$

$18n - 54 > 24n - 24$

$-6n > 30$ sign flip

$\boxed{n < -5}$

(11) $x-1 \le 3x+7 < 2x+8$

$x-8 \le 3x < 2x+1$

$x-8 \le 3x$ and $3x < 2x+1$

$-8 \le 2x$ and $x < 1$

$\boxed{-4 \le x < 1}$

(12) $3n-4 > 11$ or $2n-4 < -2$

$3n > 15$ or $2n < 2$

$\boxed{n > 5 \text{ or } n < 1}$

(13) $5x - 3n = x^2 - 2mn$

$2mn - 3n = x^2 - 5x$

$n(2m-3) = x^2 - 5x$

$\boxed{n = \frac{x^2-5x}{2m-3} \text{ for } 2m-3 \neq 0}$

(14)

	now	in 6
Mrs. McCann	n	$n+6$
Arthur	$57-n$	$63-n$

$n+6 = 2(63-n)$

$n+6 = 126-2n$

$3n = 120$

$n = 40$ $57-n =$ $\boxed{17 \text{ yrs old}}$

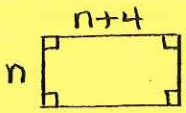
(15) $5n - (-2) = -13$

$5n + 2 = -13$

$5n = -15$

$\boxed{n = -3}$

(16)



$2n + 2(n+4) = 52$

$4n = 44$

$n = 11$

$\boxed{11 \text{ by } 15 \text{ ft.}}$

(17) $\frac{\text{part}}{\text{whole}}$ $\frac{15}{n} = \frac{18}{100}$ $18n = 1500$

$n = \boxed{83.3}$

(18) $\frac{\text{purch pr}}{\text{org pr}}$ $\frac{51.20}{n} = \frac{80}{100}$ $80n = 5120$

$n = 64$

$64 - 51.20 = \boxed{\$12.80}$

(19) $-7 < 4n+1 < 26$

$-8 < 4n < 25$

$-2 < n < \frac{25}{4}$

$n = \boxed{2,4,6}$

(20) $.075n + 2(.075) = 725$

$.075n + .350 = 725$

$.075n = 375$

$n = 5000$

$\boxed{\$5000}$

(21) $|x| + 3 < 2$ $\boxed{\text{no solutions}}$

$|x| < -1$

absolute value must be ≥ 0

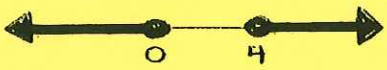
(22) $|5n-10| + 15 \ge 25$

$|5n-10| \ge 10$

$5n - 10 \ge 10$ or $5n - 10 \le -10$

$5n \ge 20$ or $5n \le 0$

$\boxed{n \ge 4 \text{ or } n \le 0}$



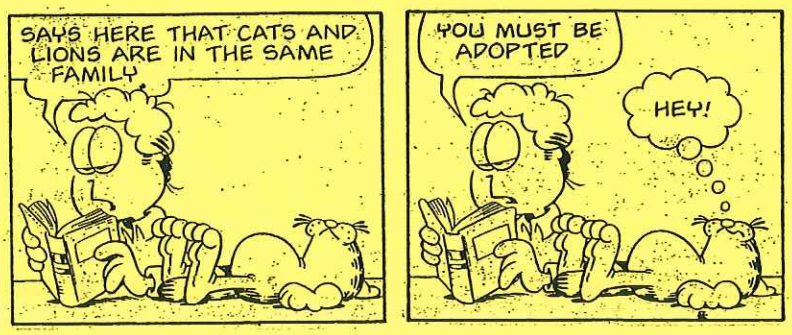
(23) $|3n| - 6 < 12$

$|3n| < 18$

$3n < 18$ and $3n > -18$

$n < 6$ and $n > -6$

$\boxed{-6 < n < 6}$



Quarterly Exam #1

REMEDIATION & EXTRA PRACTICE – Key

① Transitive Property of Equality

Associative Property of Multiplication

② Commutative Property of Addition

Symmetric Property of Equality

③ $2ab^2 - cb^3$
$2(-2)(-1)^2 - (2)(-1)^3$
$2(-2)(1) - (2)(-1)$
$(-4) - (-2)$
$(-4) + (2) = -2$

$abc + 2a^2b$
$(-2)(-1)(2) + 2(-2)^2(-1)$
$(-2)(-1)(2) + 2(4)(-1)$
$(4) + (-8) = -4$

④ $3bc - 2b^5 + ac$
$3(-1)(2) - 2(-1)^5 + (-2)(2)$
$3(-1)(2) - 2(-1) + (-2)(2)$
$(-6) - (-2) + (-4)$
$(-6) + (2) + (-4) = -8$

$2b - ac - b^2c^2$
$2(-1) - (-2)(2) - (-1)^2(2)^2$
$2(-1) - (-2)(2) - (1)(4)$
$(-2) - (-4) - (4) = (-2) + (4) + (-4) = -2$

⑤ $3xy - 2x(x-4y) - 2xy + 3x^2$
$3xy - 2x^2 + 8xy - 2xy + 3x^2$
$x^2 + 9xy$

$a^2b - 2a(a+ab) - 5a^2$
$a^2b - 2a^2 - 2a^2b - 5a^2$
$-a^2b - 7a^2$

⑥ $4a(a+b) - 2a(b-3a)$
$4a^2 + 4ab - 2ab + 6a^2$
$10a^2 + 2ab$

$2xy - 3x(y-2) + y(x-3)$
$2xy - 3xy + 6x + xy - 3y$
$6x - 3y$

⑦ $\frac{3x+7}{2} = x+1$

$3x + 7 = 2x + 2$
$x = -5$

$3n - \frac{2n}{3} = 2(n+1)$
$3\left[3n - \frac{2n}{3} = 2n+2\right]$
$9n - 2n = 6n + 6$
$n = 6$

⑧ $3(3n-5) - 4n = 5$
$9n - 15 - 4n = 5$
$5n - 15 = 5$
$5n = 20$
$n = 4$

$2(3x-4) - 2(x+3) = x - 11$
$6x - 8 - 2x - 6 = x - 11$
$4x - 14 = x - 11$
$3x = 3$
$x = 1$

⑨ $\frac{2(4x-3)}{5} > \frac{2x+2}{3}$

$6(4x-3) > 10x + 10$
$24x - 18 > 10x + 10$
$14x > 28 \quad x > 2$

$\frac{3(n-4)}{4} \leq \frac{n-3}{2}$

$6(n-4) \leq 4n-12$

$6n-24 \leq 4n-12$

$2n \leq 12$

$n \leq 6$

⑩ $2y+5x = xy+3$

$5x-xy = 3-2y$

$x(5-y) = 3-2y$

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

$3xy+2 = -2x+3y$

$3xy+2x = 3y-2$

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

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

⑪ $x-4 < 3x+2 \leq x+8$

$x-4 < 3x+2$ and $3x+2 \leq x+8$

$-6 < 2x$ and $2x \leq 6$

$-3 < x$ and $x \leq 3$

$-3 < x \leq 3$

$2x-6 \leq 3x+8 \leq x+14$

$2x-6 \leq 3x+8$ and $3x+8 \leq x+14$

$-14 \leq x$ and $2x \leq 6$

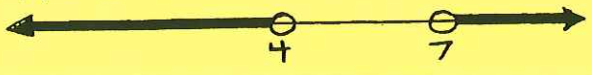
$x \leq 3$

$-14 \leq x \leq 3$

⑫ $2n-5 > 9$ or $3n-5 < 7$

$2n > 14$ or $3n < 12$

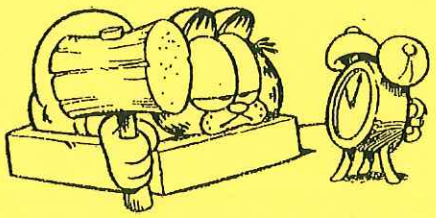
$n > 7$ or $n < 4$



$n+3 \leq -5$ or $2n-3 \geq 7$

$n \leq -8$ or $2n \geq 10$

$n \geq 5$

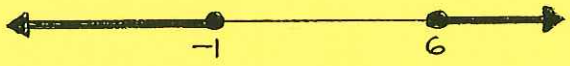


⑬ $|2n-5| \geq 7$

$2n-5 \geq 7$ or $2n-5 \leq -7$

$2n \geq 12$ or $2n \leq -2$

$n \geq 6$ or $n \leq -1$

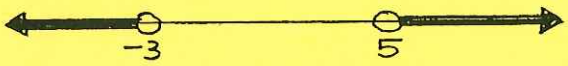


$|3n-3| > 12$

$3n-3 > 12$ or $3n-3 < -12$

$3n > 15$ or $3n < -9$

$n > 5$ or $n < -3$



⑭ $|2n-5|-8 < 3$

$|2n-5| < 11$

$2n-5 < 11$ and $2n-5 > -11$

$2n < 16$ $\quad$ $2n > -6$

$n < 8$ $\quad$ $n > -3$

$-3 < n < 8$

$|n+2|-6 \leq 4$

$|n+2| \leq 10$

$n+2 \leq 10$ and $n+2 \geq -10$

$n \leq 8$ $\quad$ $n \geq -12$

$-12 \leq n \leq 8$

(15)

	Now	4 ago	In 2
Jay	$4n$	$4n-4$	
Paul	n		$n+2$

$4n-4 = 2(n+2)$
$4n-4 = 2n+4$
$2n = 8$
$n = 4$
Jay last year $4n-1 = 15$ yrs. old

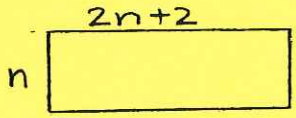
	Now	5 ago	In 1
Albert	$5n$	$5n-5$	
Joey	n		$n+1$

$5n-5 = 3(n+1)$
$5n-5 = 3n+3$
$2n = 8$
$n = 4$
Joey 2 yrs. ago $n-2 = 2$ yrs. old

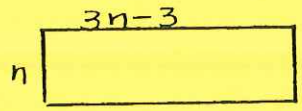
(16) $4n+8 = n-1$
$3n = -9$
$n = -3$

$2n-3 = 4n+7$
$-2n = 10$
$n = -5$

(17)



$2(n) + 2(2n+2) = 22$
$2n+4n+4 = 22$
$6n = 18$
$n = 3$
dimensions: 3 by 8
area = 24 in^2



$2(n)+2(3n-3) = 34$
$2n+6n-6 = 34$
$8n = 40$
$n = 5$
dimensions 5 by 12 in.
area = 60 in^2

(18) sale pr. $\frac{15.64}{n} = \frac{85}{100}$
org. pr.

$85n = 1564$
$n = 18.4$
Savings: \$18.40 − \$15.64
\$2.76

Coupon pr. $\frac{9.12}{n} = \frac{95}{100}$
org. pr

$95n = 912$
$n = 9.6$
org. price: \$9.60

(19) $-9 < 2n+6 < 10$
$-9 < 2n+6$ and $2n+6 < 10$
$-15 < 2n$ and $2n < 4$
$-\frac{15}{2} < n$ and $n < 2$

$-\frac{15}{2} < n < 2$

negative, even: $-6, -4, -2$

$-12 < 3n+1 < 11$

$-12 < 3n+1$ and $3n+1 < 11$

$-13 < 3n$ and $3n < 10$

$-\frac{13}{3} < n$ and $n < \frac{10}{3}$

$-\frac{13}{3} < n < \frac{10}{3}$

positive, odd: 1, 3

(20) $180 + .12n = 708$

$.12n = 528$

$n = 4400$

Sales: \$4400

$2(120) + .04n = 631.20$

$240 + .04n = 631.20$

$.04n = 391.2$

$n = 9780$

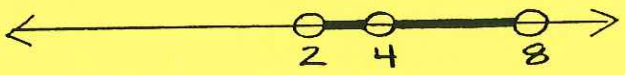
Sales: \$9780

(21) $|x-5| < 3$ and $x \neq 4$

$[x-5 < 3$ and $x-5 > -3]$ and $x \neq 4$

$[x < 8$ and $x > 2]$ and $x \neq 4$

$(2 < x < 8)$ and $x \neq 4$



$|2x-3| \geq 7$ and $x \neq 7$

$[2x-3 \geq 7$ or $2x-3 \leq -7]$ and $x \neq 7$

$[2x \geq 10$ or $2x \leq -4]$ and $x \neq 7$

$(x \geq 5$ or $x \leq -2)$ and $x \neq 7$