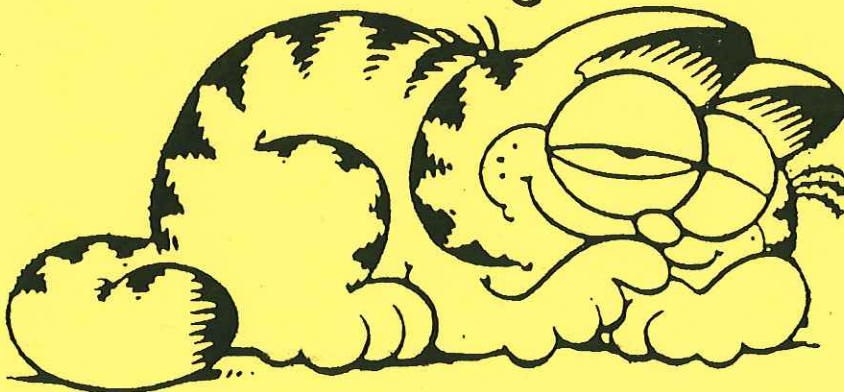


Friendship Jr. High School
Accelerated Math Program

Algebra

*In today's busy
world, relaxation is
practically a lost
art form . . .*



1

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



⑥ n = the number

$$67 - 2n = 39$$

$$-2n = -28$$

$$(-2n)\left(-\frac{1}{2}\right) = (-28)\left(-\frac{1}{2}\right)$$

$$n = \boxed{14}$$



⑦ n = Tyrone's age

$$2n + 17 = 53$$

$$2n = 36$$

$$(2n)\left(\frac{1}{2}\right) = (36)\left(\frac{1}{2}\right)$$

$$n = \boxed{18 \text{ years old}}$$

⑧

	<u>now</u>	<u>27 ago</u>
Clarice	n	$n - 27$

$$n - 27 = 21 \quad n = \boxed{48 \text{ yrs old}}$$

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

$$(n) + (n + 5) = 137$$

$$2n + 5 = 137$$

$$2n = 132 \quad n = \boxed{66 \text{ in. tall}}$$

⑩ Mary Lou's height = n

$$2n + 17 = 141$$

$$2n = 124$$

$$(2n)\left(\frac{1}{2}\right) = (124)\left(\frac{1}{2}\right)$$

$$n = \boxed{62 \text{ in. tall}}$$

⑪

	<u>now</u>	<u>5 ago</u>
Dad	$n + 27$	$n + 22$
Bob	n	$n - 5$

$$(n + 22) + (n - 5) = 45$$

$$2n + 17 = 45$$

$$2n = 28$$

$$\left(\frac{1}{2}\right)(2n) = \left(\frac{1}{2}\right)(28)$$

$$n = 14$$

14
yrs old



⑫

	<u>now</u>	<u>in 8</u>
Mom	$56 - n$	$64 - n$
Daughter	n	$n + 8$

$$(64 - n) = 2(n + 8)$$

$$64 - n = 2n + 16$$

$$64 - 3n = 16$$

$$-3n = -48$$

$$\left(\frac{1}{3}\right)(-3n) = \left(\frac{1}{3}\right)(-48)$$

$$n = \boxed{16 \text{ yrs old}}$$

⑬

	<u>now</u>	<u>5 ago</u>
Bill	$50 - n$	$45 - n$
Roy	n	$n - 5$

$$(45 - n) = 3(n - 5)$$

$$45 - n = 3n - 15$$

$$45 - 4n = -15$$

$$-4n = -60$$

$$\left(-\frac{1}{4}\right)(-4n) = \left(-\frac{1}{4}\right)(-60)$$

$$n = 15$$

$$\text{Bill} = 50 - n = 50 - 15 = 35$$

next year = 36 yrs old

⑭

	<u>now</u>	<u>3 ago</u>
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

	<u>now</u>	<u>next yr</u>
Sheila	n	$n + 1$
Sister	$n + 2$	$n + 3$

$$(n + 1) + (n + 3) = 42$$

$$2n + 4 = 42$$

$$2n = 38$$

$$\left(\frac{1}{2}\right)(2n) = \left(\frac{1}{2}\right)(38)$$

$$n = 19$$

$$\text{Sister} = n + 2 = 19 + 2 = 21$$

Sister = 21 yrs old

1.3

Answer Key

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\textcircled{15} 3n - m + 4n + 6m \\ \boxed{7n + 5m}$$

$$\textcircled{16} 2a - 3b - 5a + b \\ \boxed{-3a - 2b}$$

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

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

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

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

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

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

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

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

$$\textcircled{25} 2n - 3$$

$$\textcircled{26} (n+1)(2n-7)$$

$$\textcircled{27} \begin{array}{ccc} & \text{now} & \text{in 4} \\ \text{Sue} & n+8 & n+12 \\ \text{Mary} & n & n+4 \end{array}$$

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

$$2n+8 = n+12$$

$$n = 4$$

Mary last yr $n-1$

$$n-1 = 3$$

$$\boxed{3 \text{ yrs old}}$$

$$\textcircled{28} \begin{array}{ccc} & \text{now} & \text{9 ago} \\ \text{Bart} & n & n-9 \\ \text{Jim} & 30-n & 21-n \end{array}$$

$$n-9 = 2(21-n)$$

$$n-9 = 42-2n$$

$$3n = 51$$

$$\left(\frac{1}{3}\right)(3n) = \left(\frac{1}{3}\right)(51)$$

$$n = 17$$

$$\text{Bart} = \boxed{17 \text{ yrs old}}$$

$$\textcircled{29} \text{Multiplicative Inverse}$$

- ③① Symmetric Property of Equality
- ③② Multiplicative Identity
- ③③ Reflexive Property of Equality
- ③④ Associative Property of multiplication
- ③⑤ Commutative Property of Addition

- ③⑥ Additive Inverse
- ③⑦ Commutative Property of Addition
- ③⑧ Zero Property
- ③⑨ Associative Property of Addition
- ③⑩ Substitution Property of Equality
- ③⑪ $5n-3$

③⑫ $2n+7$

③⑬ $(n-9)(3n)$

③⑭ $2n+(4n-2)$

③⑮ $n = \text{the number}$

$2n-12=2$

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



Unit 1

REVIEW

Answer Key

③⑯ $n = \text{the number}$

$4n+3=27$

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

③⑰

	<u>now</u>	<u>6 ago</u>
Simon	$n+4$	$n-2$
Art	n	$n-6$

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

$n-2=3n-18$

$16=2n \quad n=8$

$(n+4)+2=14$

14 yrs old

③⑱

	<u>now</u>	<u>4 ago</u>
Betty	$n-6$	$n-10$
Jean	n	$n-4$

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

$2n-20=n-4$

$n=16$

Jean is 16 now

$21-16=5$

Jean will be 21 in 5 years



- 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

(26)

	<u>now</u>	<u>in 2</u>
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)

	<u>now</u>	<u>6 ago</u>
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 $(2n-2)(n+3)$

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

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

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

$$\begin{aligned} ⑥ & n = \text{the number} \\ & 4n - 12 = 16 \\ & 4n = 28 \quad n = \boxed{7} \end{aligned}$$

$$\begin{aligned} ⑦ & \begin{array}{ccc} & \text{now} & 6 \text{ ago} \\ \text{Ben} & 24-n & 18-n \\ \text{Bill} & n & n-6 \end{array} \\ & n-6 = 2(18-n) \\ & n-6 = 36-2n \\ & 3n = 42 \\ & n = 14 \\ & \text{Ben } (24-n) = 10 \\ & \text{next birthday} = \boxed{11 \text{ yrs old}} \end{aligned}$$

$$\begin{aligned} ⑭ & \begin{array}{ccc} & \text{in 3} & \text{now} & \text{2 ago} \\ \text{Jenny} & 2n & 2n-3 & 2n-5 \\ \text{Craig} & n & n-3 & n-5 \end{array} \end{aligned}$$

$$\begin{aligned} 2n-5 &= 7(n-5) \\ 2n-5 &= 7n-35 \\ 30 &= 5n \\ n &= 6 \end{aligned}$$

	now
J	9
C	+3
	12

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

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

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



Unit 1

REMIEDIATION - 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 $n = \text{the number}$

$$2n+3=25$$

$$2n=22 \quad n = \boxed{11}$$

⑦

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

$$2n-8 = 4(n-8)$$

$$2n-8 = 4n-32$$

$$24 = 2n$$

$$n = 12$$

$$2 \text{ yrs ago } (n-2) = \boxed{10 \text{ yrs old}}$$

⑧

$$2(3b-c)$$

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

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

$$2(-9) = \boxed{-18}$$

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

$$2a(a-ab) - 3a^2(z-b) - a^2b$$

$$2a^2 - 2a^2b - 6a^2z + 3a^2b - a^2b$$

$$\boxed{-4a^2z}$$

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	$n+4$	$n+6$

$$4n+6 = 2(n+6)$$

$$4n+6 = 2n+12$$

$$2n = 6$$

$$n = 3$$

$$\text{Tom now } (4n+4) = 16$$

$$\text{last year} = 15$$

15 yrs old



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 $n = \text{the number}$
 $2n - 4 = 16$
 $2n = 20$
 $n = \boxed{10}$

⑩

	<u>now</u>	<u>6 ago</u>
Dennis	$n - 4$	$n - 10$
Margaret	n	$n - 6$

$n - 6 = 3(n - 10)$
 $n - 6 = 3n - 30$
 $-2n = -24$
 $n = 12$
 $n - 1 = \boxed{11 \text{ years old}}$

⑪

	<u>now</u>	<u>In 5</u>
Dobie	n	$n + 5$
Maynard	$35 - n$	$40 - n$

$n + 5 = 2(40 - n)$
 $n + 5 = 80 - 2n$
 $3n = 75$
 $n = 25$
 $35 - n = \boxed{10 \text{ years old}}$

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

	<u>now</u>	<u>3 ago</u>	<u>In 3</u>
Mike	$3n + 3$	$3n$	$3n + 6$
Tony	$n + 3$	n	$n + 6$

$3n + 6 = 2(n + 6)$
 $3n + 6 = 2n + 12$
 $n = 6$
 $3n + 3 = \boxed{21 \text{ yrs old}}$

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



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

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

$$\textcircled{2} \frac{2}{7}(21x+35a) + \frac{4}{7}(35x-21a)$$

$$-6x-10a+20x-12a = \boxed{14x-22a}$$

$$\textcircled{3} \frac{3}{4}(4a-12b) + \frac{1}{8}(16a+48b)$$

$$3a-9b+2a+6b = \boxed{5a-3b}$$

$$\textcircled{4} \frac{5}{6}(-24a+36b) + (-\frac{1}{3})(60a-42b)$$

$$-20a+30b-20a+14b$$

$$\boxed{-40a+44b}$$

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

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

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

$$\textcircled{6} \frac{1}{2}(-\frac{2}{3}a - \frac{3}{4}b) - \frac{3}{4}(\frac{1}{9}a - \frac{1}{2}b)$$

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

$$\textcircled{7} \frac{3a+9}{3} = \boxed{a+3}$$

$$\textcircled{8} \frac{6x+24}{6} = \boxed{x+4}$$

$$\textcircled{9} \frac{7a+35}{-7} = \boxed{-a-5}$$

$$\textcircled{10} \frac{14n-56}{-7} = \boxed{-2n+8}$$

$$\textcircled{11} \frac{25x+14}{5}$$

$$\textcircled{12} \frac{-3n-8}{4}$$

$$\textcircled{13} \frac{16n-8x}{-12}$$

$$\textcircled{14} \frac{15x-10y}{-10}$$

$$\frac{-4n+2x}{3}$$

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

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

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

2.2

Answer Key



$$\textcircled{1} \frac{4x+5}{7}$$

$$4x+5=49$$

$$4x=44$$

$$\boxed{x=11}$$

$$\textcircled{2} \frac{4n+8}{16} = 7$$

$$4n+8=112$$

$$4n=104$$

$$\boxed{n=26}$$

$$\textcircled{3} \frac{3n-5}{-7} = n+5$$

$$3n-5=-7n-35$$

$$10n=-30$$

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

$$\textcircled{4} \frac{2x+6}{2} = 3x+11$$

$$2x+6=6x+22$$

$$-4x=16$$

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

$$\textcircled{5} 3-4x=10x+10$$

$$-14x=7$$

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

$$\textcircled{6} 3x-5=7x+7$$

$$-4x=12$$

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

$$\textcircled{7} 17+2n=21+2n$$

$$17=21$$

false equation

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

$$\textcircled{8} -5x-1=-5x-1$$

$$-1=-1$$

identity

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

$$\textcircled{9} -3(n+5)=3(n-1)$$

$$-3n-15=3n-3$$

$$-6n=12$$

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

$$\textcircled{10} 4(2a-1)=-10(a-5)$$

$$8a-4=-10a+50$$

$$18a=54$$

$$\boxed{a=3}$$

$$\begin{aligned} \textcircled{11} \quad -2(2x-3) &= 6-4x \\ -4x+6 &= 6-4x \\ 6 &= 6 \text{ identity} \end{aligned}$$

all solutions

$$\begin{aligned} \textcircled{12} \quad 5n+4 &= 7(n+1)-2n \\ 5n+4 &= 7n+7-2n \\ 5n+4 &= 5n+7 \\ 4 &= 7 \text{ false eq} \end{aligned}$$

no solutions

$$\begin{aligned} \textcircled{13} \quad 3(x-5) &= \frac{1}{5}(10x-25) \\ 3x-15 &= 2x-5 \end{aligned}$$

$$x=10$$

$$\begin{aligned} \textcircled{14} \quad 4(2n-8) &= \frac{1}{7}(49n+70) \\ 8n-32 &= 7n+10 \end{aligned}$$

$$n=42$$

$$\textcircled{15} \quad \frac{2n-6}{3} = \frac{3(n+2)}{2}$$

$$\frac{2n-6}{3} = \frac{3n+6}{2}$$

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

$$4n-12 = 9n+18$$

$$-5n = 30$$

$$n = -6$$

$$\textcircled{16} \quad \frac{5x-4}{6} = \frac{4(2-x)}{-8}$$

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

$$-8(5x-4) = 6(8-4x)$$

$$-40x+32 = 48-24x$$

$$-16x = 16$$

$$x = -1$$

$$\begin{aligned} \textcircled{17} \quad x+r &= 2d \\ x &= 2d-r \end{aligned}$$

$$\textcircled{18} \quad 5x = y$$

$$x = \frac{y}{5}$$

$$\textcircled{19} \quad \frac{d+x}{e} = f$$

$$d+x = ef$$

$$x = ef - d$$

$$\textcircled{20} \quad \frac{x+a}{b} = c$$

$$x+a = bc$$

$$x = bc - a$$

$$\textcircled{21} \quad ax+b = c$$

$$ax = c - b$$

$$x = \frac{c-b}{a}$$

for $a \neq 0$

$$\textcircled{22} \quad ex-2y = 3z$$

$$ex = 3z + 2y$$

$$x = \frac{3z+2y}{e}$$

for $e \neq 0$

$$\textcircled{23} \quad ax-b = cx-3b$$

$$ax-cx = -2b$$

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

$$x = \frac{-2b}{a-c}$$

for $a \neq c$

$$\textcircled{24} \quad dx+c = 2x$$

$$dx-2x = -c$$

$$x(d-2) = -c$$

$$x = \frac{-c}{d-2} \text{ for } d \neq 2$$

2.3

Answer Key

$$\textcircled{1} \quad n = \text{the number}$$

$$2n+4n = 96$$

$$6n = 96$$

$$n = \boxed{16}$$

$$\textcircled{2} \quad n = \text{the number}$$

$$2n+12 = 3n-31$$

$$-n = -43$$

$$n = \boxed{43}$$

$$\textcircled{3} \quad n = \text{the number}$$

$$n-(2n-5) = 9$$

$$n-2n+5 = 9$$

$$-n+5 = 9$$

$$-n = 4$$

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

must use parenthesis

$$\textcircled{4} \quad n = \text{the number}$$

$$5n-(2n+4) = 119$$

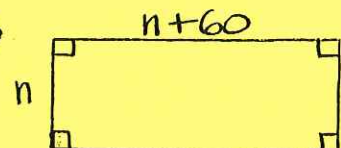
$$5n-2n-4 = 119$$

$$3n-4 = 119$$

$$3n = 123$$

$$n = \boxed{41}$$

⑤



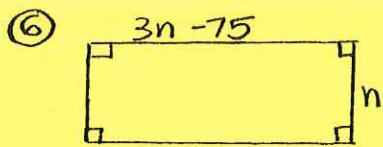
$$2n+2(n+60) = 920$$

$$2n+2n+120 = 920$$

$$4n = 800$$

$$n = 200 \text{ m width}$$

$$n+60 = \boxed{260 \text{ m}}$$



$$2n + 2(3n - 75) = 370$$

$$2n + 6n - 150 = 370$$

$$8n = 520$$

$$n = 65 \text{ width}$$

$$3n - 75 = 120 \text{ length}$$

65 by 120 yds

⑦ $n = \text{original price}$

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

$$\frac{1}{2}n = 32$$

$$n = 64 \quad \boxed{\$64}$$



$$(x) + (x+2) + (x+4) = 27$$

$$3x + 6 = 27$$

$$3x = 21$$

$$x = 7 \quad x+4 = \boxed{11 \text{ cm}}$$

⑨

$$x = 30$$

$$x+2 = 32$$

$$x+4 = 34$$

$$x+6 = 36$$

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

$$3x + 6 = 96$$

$$3x = 90$$

$$x = 30$$

⑩

$$x = 57$$

$$x+2 = 59$$

$$x+4 = 61$$

$$x+6 = \boxed{63} \leftarrow$$

$$x+2(x+2) = 175$$

$$x+2x+4 = 175$$

$$3x+4 = 175$$

$$3x = 171 \quad x = 57$$

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

$$-4x - 2y - 2y - 4x$$

$$\boxed{-8x - 4y}$$

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

⑬ $2a+8x+b=ax$

$$8x - ax = -2a - b$$

$$x(8-a) = -2a - b$$

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

⑭ $\frac{4x-2}{7} = \frac{2(2-x)}{-5}$

$$-5(4x-2) = 7(4-2x)$$

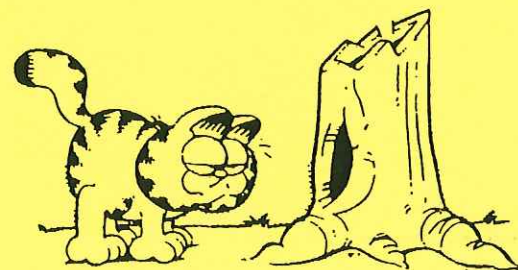
$$-20x + 10 = 28 - 14x$$

$$-6x = 18$$

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

2.4

Answer Key



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

$$20n = 2800$$

$$n = \boxed{140}$$

② $\frac{\text{part}}{\text{whole}} \frac{37}{296} = \frac{n}{100}$

$$296n = 3700$$

$$n = 12.5 \quad \boxed{12.5\%}$$

③ $\frac{\text{part}}{\text{whole}} \frac{n}{6070} = \frac{4.3}{100}$

$$100n = (6070)(4.3)$$

$$100n = 26,101$$

$$n = \boxed{\$261.01}$$

④ $\frac{\text{part}}{\text{whole}} \frac{n}{9.40} = \frac{6.125}{100}$

$$100n = (9.40)(6.125)$$

$$100n = 57.575$$

$$n = .57575 \quad \boxed{\$.58}$$

⑤ $\frac{\text{part}}{\text{whole}} \frac{7030.50}{n} = \frac{107.5}{100}$

$$107.5n = (7030.50)(100)$$

$$107.5n = 703,050$$

$$n = \boxed{\$6540}$$

⑥ $\frac{\text{part}}{\text{whole}} \frac{54,000}{n} = \frac{108.4}{100}$

$$108.4n = (54,000)(100)$$

$$108.4n = 5,400,000$$

$$n \approx \boxed{\$49,815.50}$$

⑦ $\frac{\text{part}}{\text{whole}} \frac{n}{5000} = \frac{.1}{100}$
 $100n = 500$
 $n = \boxed{\$5}$

⑧ $\frac{\text{part}}{\text{whole}} \frac{90}{n} = \frac{60}{100}$
 $60n = 9000$
 $n = \boxed{150}$

⑨ $\frac{\text{correct}}{\text{tot ques}} \frac{34}{n} = \frac{85}{100}$
 $85n = 3400$
 $n = \boxed{40 \text{ questions}}$

⑩ $\frac{\text{metal}}{\text{tot ore}} \frac{n}{180} = \frac{3.2}{100}$
 $100n = 576$
 $n = \boxed{5.76 \text{ Kg}}$

⑪ $\frac{\text{purch pr}}{\text{org pr}} \frac{21.45}{n} = \frac{75}{100}$
 $75n = 2145$
 $n = 28.6$
 $\$28.60 - \21.45
 $\boxed{\$7.15}$

⑫ $\frac{\text{discount}}{\text{org pr}} \frac{2.72}{n} = \frac{8}{100}$
 $8n = 272$
 $n = 34$
 $34 - 2.72 = \boxed{\$31.28}$

⑬ $n = \text{total sales}$
 $.08n + 125 = 200$
 $.08n = 75$
 $n = \boxed{\$937.50}$

⑭ $n = \text{total sales}$
 $.055n + 320 = 551$
 $.055n = 231$
 $n = \boxed{\$4200}$

⑮ $n = \text{total sales}$
 $.06n + 3(215) = 975$
 $.06n + 645 = 975$
 $.06n = 330$
 $n = \boxed{\$5500}$

⑯ $n = \text{total sales}$
 $.075 + 2(190) = 665$
 $.075n + 380 = 665$
 $.075n = 285$
 $n = \boxed{\$3800}$

⑰ $\frac{1}{4}(-\frac{2}{3}a - \frac{1}{2}b) - \frac{2}{3}(\frac{3}{4}b - \frac{1}{2}a)$
 $-\frac{1}{6}a - \frac{1}{8}b - \frac{1}{2}b + \frac{1}{3}a$
 $\boxed{\frac{1}{6}a - \frac{5}{8}b}$

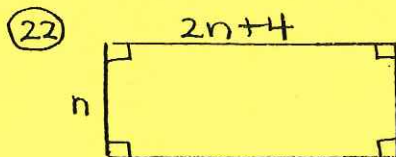
⑱ $\frac{24a - 36b}{-18} = \boxed{\frac{-4a + 6b}{3}}$

⑲ $3(4n - 2) = \frac{2}{3}(9n - 9) + 6n$
 $12n - 6 = 6n - 6 + 6n$
 $12n - 6 = 12n - 6$
 $-6 = -6$ identity

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 $3ab - c = 2ac$
 $3ab - 2ac = c$
 $a(3b - 2c) = c$
 $\boxed{a = \frac{c}{3b - 2c}}$
 for $3b \neq 2c$



$2(n) + 2(2n + 4) = 56$
 $2n + 4n + 8 = 56$
 $6n = 48$
 $n = 8$

dimensions
 8 by 20
 $8 \times 20 = 160$

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

㉓ $\frac{6x}{7x+1}$
 $\rightarrow \boxed{8}x+2$

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



Unit 2 REVIEW Answer Key



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

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

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

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

$$\textcircled{3} \frac{-10x-15y}{-5}$$

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

$$\textcircled{4} \frac{18a-12b}{6}$$

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

$$\textcircled{5} \frac{-26m+18n}{12}$$

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

$$\textcircled{6} \frac{20a-15b}{-10}$$

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

$$\textcircled{7} \frac{3n-5}{-4} = n-11$$

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

$$7n = 49$$

$$\boxed{n=7}$$

$$\textcircled{8} \frac{-2x+5}{5} = 2x+13$$

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

$$-12x = 60$$

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

$$\textcircled{9} 3(4n-1) = 2(3n+4) + 6n$$

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

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

$$-3 = 8 \text{ False equation}$$

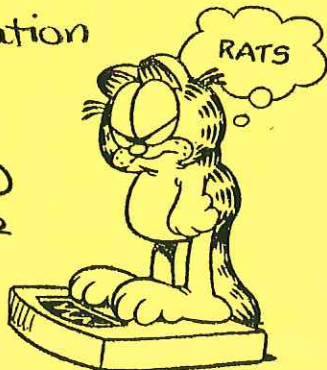
$$\boxed{\text{no solutions}}$$

$$\textcircled{10} 5(6-3x) = 3(x+4)$$

$$30-15x = 3x+12$$

$$-18x = -18$$

$$\boxed{x=1}$$



$$\textcircled{11} \frac{1}{2}(5n-4) = 2n-1$$

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

$$5n-4 = 4n-2$$

$$\boxed{n=2}$$

$$\textcircled{12} \frac{3}{4}(n+2) = 3-3n$$

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

$$3n+9 = 12-2n$$

$$15n = 3$$

$$\boxed{n=1/5}$$

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

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

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

$$-3x = 3$$

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

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

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

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

$$39n = -117$$

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

$$\textcircled{15} 4ax-ab = 3c-cx$$

$$4ax+cx = ab+3c$$

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

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

$$\textcircled{16} 2y+3ax = 4y+x$$

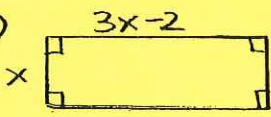
$$3ax-x = 2y$$

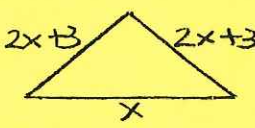
$$x(3a-1) = 2y$$

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

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

18) $n = \text{a number}$
 $n - (2n - 5) = 7$
 $n - 2n + 5 = 7$
 $-n = 2$
 $n = \boxed{-2}$

19) 
 $2(x) + 2(3x - 2) = 28$
 $2x + 6x - 4 = 28$
 $8x = 32$
 $x = 4$
 $3x - 2 = 10$
 $4 \text{ by } 10$
 $\text{Area} = \boxed{40 \text{ cm}^2}$

20) 
 $(x) + 2(2x + 3) = 41$
 $x + 4x + 6 = 41$
 $5x = 35$
 $x = 7 \quad \boxed{7 \text{ in}}$

21) $2x$
 $3x + 1$
 $\rightarrow \boxed{4}x + 2$
 $5x + 3$
 $x + 3(x + 3) = 17$
 $x + 3x + 9 = 17$
 $4x = 8$
 $x = 2$



22) $-7x$
 $-6x + 1$
 $\rightarrow \boxed{-5}x + 2$
 $(x + 2) - (2x + 1) = 8$
 $x + 2 - 2x - 1 = 8$
 $-x + 1 = 8$
 $-x = 7$
 $x = -7$

23) $7x$
 $\rightarrow \boxed{9}x + 2$
 $11x + 4$
 $2(x + 4) - (x + 2) = 13$
 $2x + 8 - x - 2 = 13$
 $x + 6 = 13$
 $x = 7$

24) $10x$
 $12x + 2$
 $\rightarrow \boxed{14}x + 4$
 $3x - 2(x + 4) = 2$
 $3x - 2x - 8 = 2$
 $x - 8 = 2$
 $x = 10$

25) $\frac{\text{part}}{\text{whole}} \frac{24}{64} = \frac{n}{100}$
 $64n = 2400$
 $n = 37.5$
 $\boxed{37.5\%}$

26) $\frac{\text{part}}{\text{whole}} \frac{n}{85} = \frac{2.2}{100}$
 $100n = 187$
 $n = 1.87$
 $\boxed{1.87}$

27) $\frac{\text{part}}{\text{whole}} \frac{210.75}{n} = \frac{105.375}{100}$
 $105.375n = 21075$
 $n = 200$
 $\boxed{\$200}$

28) $\frac{\text{part}}{\text{whole}} \frac{149.10}{n} = \frac{106.5}{100}$
 $106.5n = 14910$
 $n = 140 \quad \boxed{\$140}$

29) $\frac{\text{purch pr}}{\text{org pr}} \frac{30.60}{n} = \frac{90}{100}$
 $90n = 3060$
 $n = 34 \quad \boxed{\$34}$

30) $\frac{\text{discount}}{\text{org pr}} \frac{5.40}{n} = \frac{15}{100}$
 $15n = 540$
 $n = 36$
 $\$36 - \$5.40 = \boxed{\$30.60}$

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

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



Unit 2

SKILL CHECK - ANSWER KEY

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

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

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

$$\textcircled{3} \frac{4x-2}{3} = x+1$$

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

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

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

$$3n-6 = 4n$$

$$-n = 6$$

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

$$\textcircled{5} 2(5x-3) = 7(x-1) + 3x$$

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

$$10x-6 = 10x-7$$

$$-6 = -7 \text{ false equation}$$

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

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

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

$$12n-24 = 16n-16$$

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

$$\textcircled{7} 2x-ab = 3c-2ab$$

$$2x = 3c-ab$$

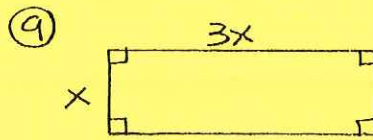
$$\boxed{x = \frac{3c-ab}{2}}$$

$$\textcircled{8} xy-2n = 3x+5$$

$$xy-3x = 5+2n$$

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

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



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

$$2x + 6x = 32$$

$$8x = 32$$

$$x = 4 \quad 3x = 12$$

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

$\textcircled{10}$

$$\rightarrow \frac{-10}{-9}x + 1$$

$$\frac{-8}{-8}x + 2$$

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

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

$$-x = 10$$



$\textcircled{11}$

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

$$100n = 525$$

$$n = \boxed{5.25}$$

$\textcircled{12}$

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

$$105.5n = 8440$$

$$n = 80$$

$$\boxed{\$80}$$

$\textcircled{13}$

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

$$88n = 2112$$

$$n = 24$$

$$\text{org pr} = \$24$$

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

$\textcircled{14}$

$$.065x + 3(230) = 976$$

$$.065x + 690 = 976$$

$$.065x = 286$$

$$x = 4400$$

$$\boxed{\$4400}$$



Unit 2

REMEDICATION - 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 $\frac{3n-7}{2} = 2n-6$

$3n-7 = 4n-12$
 $-n = -5$ $n=5$

④ $\frac{1}{2}(3x-4) = x+7$

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

⑤ $4(a-3) = 2(3a-6) - 2a$

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

all solutions

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

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

$-20n+4 = -24n-8$
 $4n = -12$ $n=-3$

⑦ $2a-4n = 3a+b$

$-4n = a+b$

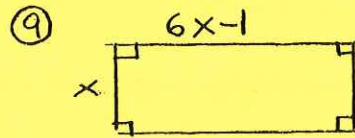
$n = \frac{-a-b}{4}$

⑧ $nm+x = xy-2n$

$nm+2n = xy-x$

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

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

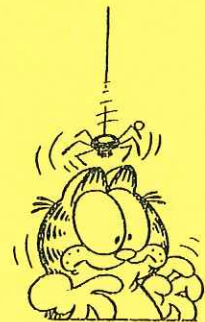


$2(x) + 2(6x-1) = 26$
 $2x + 12x - 2 = 26$
 $14x = 28$

$x=2$
 $6x-1=11$
 2 by 11 m

⑩ $-5x$
 $-3x+2$
 $-1x+4$
 $\rightarrow \boxed{1}x+6$

$3(x+6) - 2(2x+2) = 11$
 $3x+18 - 2x-2 = 11$
 $x+16 = 11$
 $x = -5$



⑪ $\frac{\text{part}}{\text{whole}} = \frac{n}{54} = \frac{6.75}{100}$
 $100n = 364.5$ $n = 3.645$

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

$12.5n = 775$
 $n = 62$ $\$62$

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

$20n = 290$
 $n = 14.5$
 $\text{org pr} = \$14.50$
 $\$14.50 - \$2.90 = \boxed{\$11.60}$

⑭ $.0825x + 4(125) = 599$

$.0825x + 500 = 599$

$.0825x = 99$

$x = 1200$

$\$1200$



Unit 2

EXTRA PRACTICE - ANSWER KEY

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

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

$$\boxed{6x-7y}$$

$$\textcircled{2} \frac{15a-20b}{5}$$

$$\boxed{3a-4b}$$

$$\textcircled{3} \frac{-12x-10y}{-8}$$

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

$$\textcircled{4} \frac{4n-2}{7} = -2$$

$$4n-2 = -14$$

$$4n = -12$$

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

$$\textcircled{5} 4(2x-5) = 2(4x+3)$$

$$8x-20 = 8x+6$$

$$-20 = 6$$

false equation

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

$$\textcircled{6} 3(x+4) = 2(3x-8)-2$$

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

$$-3x = -6$$

$$\boxed{x = 2}$$

$$\textcircled{7} \frac{3}{4}(2n-2) = 2(n+1)-2$$

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

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

$$6n-6 = 8n$$

$$-2n = 6$$

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

$$\textcircled{8} 3n-2(4n+1) = 8-5(n+2)$$

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

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

$$-2 = -2 \text{ identity}$$

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

$$\textcircled{9} \frac{4a-3}{7} = \frac{-3(a+2)}{3}$$

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

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

$$33a = -33$$

$$\boxed{a = -1}$$

$$\textcircled{10} 5a+2x = 3c$$

$$2x = 3c-5a$$

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

$$\textcircled{11} 4n-8 = -20$$

$$4n = -12$$

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

$$\textcircled{12} \begin{array}{c} 3n-2 \\ n \end{array} \boxed{}$$

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

$$2n+6n-4 = 20$$

$$8n-4 = 20$$

$$8n = 24$$

$$n = 3$$

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

$$\textcircled{13} \begin{array}{c} -7n \\ -5n+2 \\ \rightarrow \boxed{-3}n+4 \end{array} \leftarrow$$

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

$$-n+4 = n+18$$

$$-2n = 14$$

$$n = -7$$

$$\textcircled{14} \begin{array}{l} \text{part} \\ \text{whole} \end{array} \frac{8}{40} = \frac{n}{100}$$

$$40n = 800$$

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

$$\textcircled{15} \begin{array}{l} \text{part} \\ \text{whole} \end{array} \frac{n}{80} = \frac{2.25}{100}$$

$$100n = 180$$

$$n = \boxed{1.8}$$

$$\textcircled{16} \begin{array}{l} \text{part} \\ \text{whole} \end{array} \frac{32.4}{n} = \frac{60}{100}$$

$$60n = 3240$$

$$n = \boxed{\$54}$$

$$\textcircled{17} \begin{array}{l} \text{purch pr} \\ \text{org pr} \end{array} \frac{15.30}{n} = \frac{85}{100}$$

$$85n = 1530$$

$$n = \boxed{\$18}$$

$$\textcircled{18} 3(310) + .06n = 1122$$

$$930 + .06n = 1122$$

$$.06n = 192$$

$$n = \boxed{\$3200}$$

$$\textcircled{19} 2a+bx = 7-cx$$

$$bx+cx = 7-2a$$

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

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

$$\textcircled{20} \begin{array}{c} -6n \\ \rightarrow \boxed{-5}n+1 \\ -4n+2 \end{array} \leftarrow$$

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

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

$$-n = 6 \quad n = -6$$

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

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

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

all solutions



$$6) x > -5 \text{ and } x < 0$$



$$7) -3 < n < 3$$



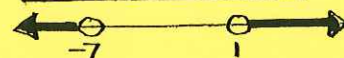
$$8) d \geq 0 \text{ or } d < 4$$



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

$$9) 3+x < -4 \text{ or } 3+x > 4$$

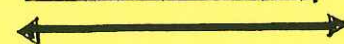
$$x < -7 \text{ or } x > 1$$



$$10) -1+b > 4 \text{ or } -1+b < 3$$

$$b > -3 \text{ or } b < 4$$

all solutions



$$11) -5 < 4-3x < 13$$

$$-5 < 4-3x \text{ and } 4-3x < 13$$

$$-9 < -3x \text{ and } -3x < 9$$

$$3 > x \text{ and } x > -3$$

$$-3 < x < 3$$



$$12) -3-x \leq 2x \leq 3+x$$

$$-3-x \leq 2x \text{ and } 2x \leq 3+x$$

$$-3 \leq 3x \text{ and } x \leq 3$$

$$-1 \leq x \text{ and } x \leq 3$$

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



$$13) 2x-1 \leq 2x+8 < 2x+4$$

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

$$-1 \leq 8 \text{ and } 8 < 4$$

true false

no solutions



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

$$14) n-1 < 2n+3 \leq n+4$$

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

$$-4 < n \text{ and } n \leq 1$$

$$-4 < n \leq 1$$



$$15) x \neq 6 \text{ and } 3x+1 > 10$$

$$x \neq 6 \text{ and } 3x > 9$$

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



$$16) 2x+4 \leq 6 \text{ or } x \geq 2x+4$$

$$2x \leq 2 \text{ or } -x \geq -4$$

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



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

$$17) \text{ intersection } -2 < x \leq 3$$



$$18) \text{ union } x \leq -4 \text{ or } x > 2$$

$$19) \text{ intersection } x \geq 0 \text{ and } x \neq 2$$

$$20) \text{ intersection } -5 < x < 1$$

3.2

Answer Key

$$1) -3 > x \text{ and } x > -7$$

$$-7 < x < -3$$

$$2) p > \frac{3}{4} \text{ and } p \leq \frac{11}{4}$$

$$\frac{3}{4} < p \leq \frac{11}{4}$$

$$3) y \leq \frac{4}{9} \text{ and } y \geq \frac{4}{3}$$

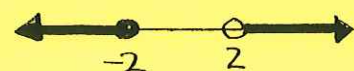
$$\frac{4}{3} \leq y \leq \frac{4}{9}$$

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

$$-\frac{13}{15} < m < \frac{6}{5}$$

$$5) r > 2 \text{ or } r \leq -2$$

union



3.3

Answer Key

- ① n = number of papers to be delivered

$$.15n \geq 5.30$$

$$n \geq 35.3$$

at least
36 papers

- ② n = number of two-volume sets sold

$$4.30n \geq 175$$

$$n \geq 40.697\dots$$

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:

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

$$n = \boxed{3, 4, 5}$$



⑤ n

7	5	3	1
9	7	5	3

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

$$2n + 2 \leq 18$$

$$2n \leq 16$$

$$n \leq 8$$

4 sets of integers
(positive, odd)

highest
odd value
for n is 7

⑥ n

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

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

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

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

$$-16 \geq -3 \text{ false inequality}$$

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 $n \neq 7$

$$n \geq 3 \text{ and } n \neq 7$$



⑪ $n - 4 < 2n + 1 \leq n + 10$

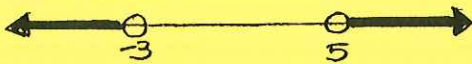
$$n - 5 < 2n \leq n + 9$$

$$-5 < n \leq 9$$

subtract 1
subtract n



⑫ $2a+1 > 11$ or $3a < a-6$
 $2a > 10$ or $2a < -6$
 $a > 5$ or $a < -3$



⑬ $x < -3$ or $x > 4$
 union

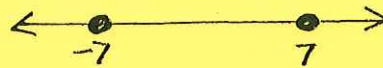
⑭ $-4 \leq x < 0$
 intersection

⑮ $x > -2$ and $x \neq 6$
 intersection

⑯ $-5 \leq x \leq 4$
 intersection

④ $|n|-4=3$
 $|n|=7$

$n=7$ or $n=-7$



⑤ $|y-1| < 4$
 $y-1 < 4$ and $y-1 > -4$
 $y < 5$ and $y > -3$

$-3 < y < 5$



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 $x \leq 3$

$1 \leq x \leq 3$



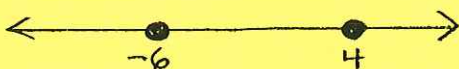
⑦ $|12-3x| \geq 12$
 $12-3x \geq 12$ or $12-3x \leq -12$
 $-3x \geq 0$ or $-3x \leq -24$

$x \leq 0$ or $x \geq 8$



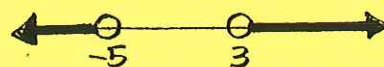
② $|y+1|=5$
 $y+1=5$ or $y+1=-5$

$y=4$ or $y=-6$



⑧ $|y+1| > 4$
 $y+1 > 4$ or $y+1 < -4$

$y > 3$ or $y < -5$



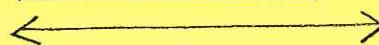
③ $|x|+7=12$
 $|x|=5$

$x=5$ or $x=-5$



⑨ $|x-3|+5 \leq 2$
 $|x-3| \leq -3$

no solutions



an absolute value cannot be negative

3.4

Answer Key



⑩ $|n+3|+7 > 5$ an absolute value must be greater than a negative
 $|n+3| > -2$
 all solutions



⑪ $|4x+4|+2 \leq 22$
 $|4x+4| \leq 20$
 $4x+4 \leq 20$ and $4x+4 \geq -20$
 $4x \leq 16$ and $4x \geq -24$
 $x \leq 4$ and $x \geq -6$

$-6 \leq x \leq 4$



⑫ $|6x+6|-3 \leq 33$
 $|6x+6| \leq 36$
 $6x+6 \leq 36$ and $6x+6 \geq -36$
 $6x \leq 30$ and $6x \geq -42$
 $x \leq 5$ and $x \geq -7$

$-7 \leq x \leq 5$



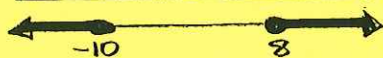
⑬ $|2x+1|+3 \geq 1$ absolute value must be greater than a negative
 $|2x+1| \geq -2$

all solutions



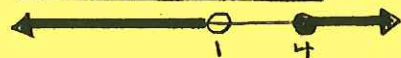
⑭ $|10x+10|-1 \geq 89$
 $|10x+10| \geq 90$
 $10x+10 \geq 90$ or $10x+10 \leq -90$
 $10x \geq 80$ or $10x \leq -100$
 $x \geq 8$ or $x \leq -10$

$x \geq 8$ or $x \leq -10$



⑮ $3n+1 < 4$ or $2n-1 \geq 7$
 $3n < 3$ or $2n \geq 8$

$n < 1$ or $n \geq 4$ union



⑯ $3x-2 \leq 5x+4 < 3x+12$ and $x \neq 0$
 $3x-6 \leq 5x < 3x+8$ subtract 4
 $-6 \leq 2x \leq 8$ subtract 3x
 $-3 \leq x < 4$ divide by 2

$-3 \leq x < 4$ and $x \neq 0$

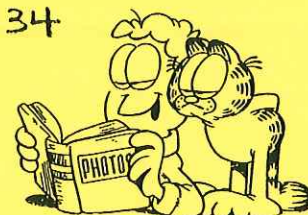
intersection



⑰ $n = \text{the integer}$
 $22 \leq 5n-7 \leq 34$
 $29 \leq 5n \leq 41$

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

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



⑱ n

-3	-1	1	3	5
-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 $4n > -8$

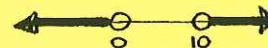
$n < 3$ and $n > -2$

$-2 < n < 3$

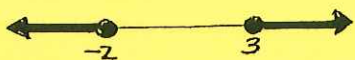


② $|x-5|-3 > 2$ $|x-5| > 5$
 $x-5 > 5$ or $x-5 < -5$

$x > 10$ or $x < 0$



③ $|2n-1| \geq 5$
 $2n-1 \geq 5$ or $2n-1 \leq -5$
 $2n \geq 6$ or $2n \leq -4$
 $n \geq 3$ 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 $y \geq -7/3$
 $-7/3 \leq y \leq 1$



⑤ $|4-2x|+3 \leq 2$
 $|4-2x| \leq -1$
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 $2n = -12$
 $n = 5$ or $n = -6$



⑦ $|4x|-2 = 6$
 $|4x| = 8$
 $4x = 8$ or $4x = -8$
 $x = 2$ or $x = -2$



⑧ $|3n-2|+4 > 2$
 $|3n-2| > -2$
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

$2(3n-9) < 4(6-n)$
 $6n-18 < 24-4n$
 $10n < 42$

$n < 21/5$



⑩ $x \geq -8$ and $x < 0$
 $-8 \leq x < 0$

⑪ union
 $x < -2$ or $x \geq 1$

⑫ intersection
 $-2 \leq x < 5$ 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

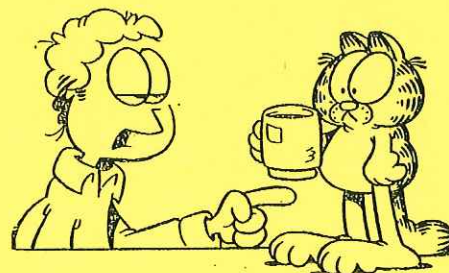
$-7 < n < 2$ and $n \neq -2$



⑭ n = sales for the year
 $21,600 < .05n + 18,000 < 24,500$
 $3600 < .05n < 6500$
 divide by .05
 $72,000 < n < 130,000$
between \$72,000 and \$130,000

⑮ n = the integer
 $21 \leq 3n-4 \leq 37$
 $25 \leq 3n \leq 41$
 $25/3 \leq n \leq 41/3$
 n is between $8\frac{1}{3}$ and $13\frac{2}{3}$
 There are five values for n
9, 10, 11, 12, 13

Unit 3 REVIEW Answer Key



① $4(n-3) \leq 2(3n-5)-6$
 $4n-12 \leq 6n-10-6$
 $4n-12 \leq 6n-16$
 $-2n \leq -4$

$n \geq 2$



② $3(2x+1) > 4(3+3x)+3$
 $6x+3 > 12+12x+3$
 $6x+3 > 15+12x$

$-6x > 12$

$x < -2$

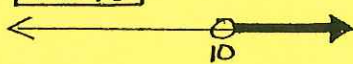


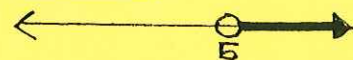
③ $4a + \frac{a}{3} \geq 2(a-5)-4$
 $3[4a + \frac{a}{3}] \geq 2a-14$
 $12a+a \geq 6a-42$

$7a \geq -42$

$a \geq -6$





$$\begin{aligned} \textcircled{4} \quad \frac{2n}{5} + 1 &< 3(n-5) - n \\ \frac{2n}{5} + 1 &< 3n - 15 - n \\ 5\left[\frac{2n}{5} + 1 < 2n - 15\right] \\ 2n + 5 &< 10n - 75 \\ -8n &< -80 \\ \boxed{n > 10} \end{aligned}$$



$$\begin{aligned} \textcircled{5} \quad \frac{2(x+4)}{3} &> \frac{x+7}{2} \\ \frac{2x+8}{3} &> \frac{x+7}{2} \\ 2(2x+8) &> 3(x+7) \\ 4x+16 &> 3x+21 \\ \boxed{x > 5} \end{aligned}$$


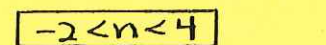
$$\begin{aligned} \textcircled{6} \quad \frac{-2(n+5)}{8} &\leq \frac{4-3n}{-7} \\ \frac{-2n-10}{8} &\leq \frac{3n-4}{7} \end{aligned}$$

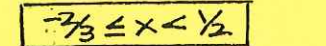
negative must be removed from the denominator before cross multiplying an inequality


$$\begin{aligned} 7(-2n-10) &\leq 8(3n-4) \\ -14n-70 &\leq 24n-32 \\ -38n &\leq 38 \\ \boxed{n \geq -1} \end{aligned}$$



$$\begin{aligned} \textcircled{7} \quad 2(3n+5) &< 3(2n-1) \\ 6n+10 &< 6n-3 \\ 10 &< -3 \\ \text{false inequality} \\ \boxed{\text{no solutions}} \end{aligned}$$



$$\begin{aligned} \textcircled{8} \quad n-3 &\geq 4n-3(n+1) \\ n-3 &\geq 4n-3n-3 \\ n-3 &\geq n-3 \\ -3 &\geq -3 \text{ identity} \\ \boxed{\text{all solutions}} \end{aligned}$$



$$\begin{aligned} \textcircled{9} \quad -2 < n \text{ and } 4 > n \\ \boxed{-2 < n < 4} \end{aligned}$$


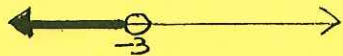
$$\begin{aligned} \textcircled{10} \quad x \geq \frac{2}{3} \text{ and } x < \frac{1}{2} \\ \boxed{-\frac{2}{3} \leq x < \frac{1}{2}} \end{aligned}$$


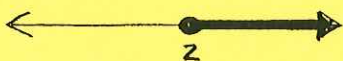
$$\begin{aligned} \textcircled{11} \quad 2n-1 > 5 \text{ or } 4+3n > 2 \\ 2n > 6 \text{ or } -3n > -6 \\ \boxed{n > 3 \text{ or } n < 2} \end{aligned}$$



$$\begin{aligned} \textcircled{12} \quad 4(x+1) &\geq -8 \text{ or } 9-5x < -1 \\ 4x+4 &\geq -8 \text{ or } -5x < -10 \\ 4x &\geq -12 \text{ or } x > 2 \\ x &\geq -3 \text{ or } x > 2 \\ \boxed{x \geq -3} \end{aligned}$$



$$\begin{aligned} \textcircled{13} \quad 3n+4 &< 3n-2 < 3n+1 \\ \text{subtract } 3n \text{ from} \\ \text{all parts:} \\ 4 &< -2 < 1 \\ \text{false inequality} \\ \boxed{\text{no solutions}} \end{aligned}$$



$$\begin{aligned} \textcircled{14} \quad n-5 &\leq 2n+1 \leq n+4 \\ n-6 &\leq 2n \leq n+3 \\ \text{subtract } 1 \uparrow \\ \text{subtract } n \downarrow \\ \boxed{-6 \leq n \leq +3} \end{aligned}$$


$$\begin{aligned} \textcircled{15} \quad 3a+4 &< -5 \text{ and } -2a > 4 \\ 3a &< -9 \text{ and } a < -2 \\ a &< -3 \text{ and } a < -2 \\ \boxed{a < -3} \end{aligned}$$


$$\begin{aligned} \textcircled{16} \quad 4x &\geq 2x+4 \text{ and } -3(2x-1) \leq 3 \\ 2x &\geq 4 \text{ and } -6x+3 \leq 3 \\ x &\geq 2 \text{ and } -6x \leq 0 \\ x &\geq 2 \text{ and } x \geq 0 \\ \boxed{x \geq 2} \end{aligned}$$


$$\begin{aligned} \textcircled{17} \quad 3n-1 &< 4n+4 < 2n+8 \\ \text{subtract } 4 \\ 3n-5 &< 4n < 2n+4 \\ 3n-5 &< 4n \text{ and } 4n < 2n+4 \\ -5 &< n \text{ and } 2n < 4 \\ -5 &< n \text{ and } n < 2 \\ \boxed{-5 < n < 2} \end{aligned}$$


$$\begin{aligned} \textcircled{18} \quad 2x-2 &> 4 \text{ or } 3x-1 < 14 \\ 2x &> 6 \text{ or } 3x < 15 \\ x &> 3 \text{ or } x < 5 \\ \text{all values of } x &\text{ are either greater than} \\ \text{3 or less than 5} \\ \boxed{\text{all solutions}} \end{aligned}$$


$$\begin{aligned} \textcircled{19} \quad x-1 &\leq 2x < x+4 \text{ and} \\ \text{subtract } x \quad x \neq 0 \\ \boxed{-1 \leq x < 4 \text{ and } x \neq 0} \end{aligned}$$




⑳ $3x-1 \leq 11$ and $x \neq -2$
 $3x \leq 12$ and $x \neq -2$

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



㉑ $-4 < x \leq 3$
 intersection

㉒ $x < -4$ or $x > 2$
 union

㉓ $x \leq 3$ 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 $11\frac{1}{2}$

$7, 8, 9, 10, 11$

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 $1\frac{2}{3}$

$-1, 0, 1$

㉗ $n =$ Sales

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

$1200 < .06n < 3000$

divide by .06

$20,000 < n < 50,000$



between
 $\$20,000$ and $\$50,000$

㉘ $n =$ sales

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

subtract 11,100

$1680 < .07n < 5180$

divide by .07

$24,000 < n < 74,000$

between
 $\$24,000$ and $\$74,000$

㉙ n

5	6	7
6	7	8
7	8	9

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

$17 \leq 3n + 3 \leq 26$

subtract 3

$14 \leq 3n \leq 23$

divide by 3

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

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

㉚ n

-2	0	2	4
0	2	4	6
2	4	6	8

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

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

subtract 6

$-7 \leq 3n \leq 14$

divide by 3

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

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

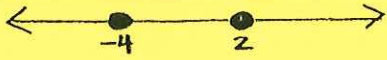
←
 n is even and
 n is between
 $-2\frac{1}{3}$ and $4\frac{2}{3}$

$$\textcircled{31} |n+1| + 4 = 7$$

$$|n+1| = 3$$

$$n+1 = 3 \text{ or } n+1 = -3$$

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



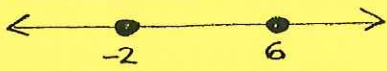
$$\textcircled{32} |2x-4| - 3 = 5$$

$$|2x-4| = 8$$

$$2x-4 = 8 \text{ or } 2x-4 = -8$$

$$2x = 12 \text{ or } 2x = -4$$

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



$$\textcircled{33} |3a-2| + 4 < 3$$

$$|3a-2| < -1$$

an absolute value must be greater than or equal to 0

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



$$\textcircled{34} |2n+3| + 4 \geq 2$$

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

an absolute value must be greater than or equal to 0

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



$$\textcircled{35} |a+4| > 2$$

$$a+4 > 2 \text{ or } a+4 < -2$$

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

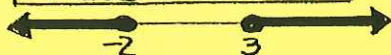


$$\textcircled{36} |2n-1| \geq 5$$

$$2n-1 \geq 5 \text{ or } 2n-1 \leq -5$$

$$2n \geq 6 \text{ or } 2n \leq -4$$

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



$$\textcircled{37} |x-6| - 2 \leq 10$$

$$|x-6| \leq 12$$

$$x-6 \leq 12 \text{ and } x-6 \geq -12$$

$$x \leq 18 \text{ and } x \geq -6$$

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



$$\textcircled{38} |2a+4| + 1 < 13$$

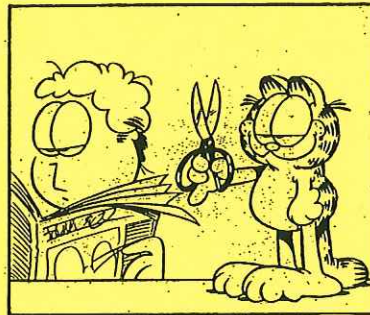
$$|2a+4| < 12$$

$$2a+4 < 12 \text{ and } 2a+4 > -12$$

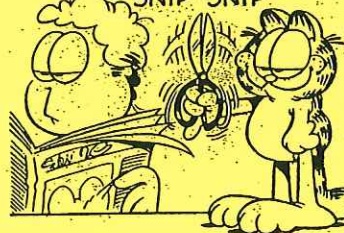
$$2a < 8 \text{ and } 2a > -16$$

$$a < 4 \text{ and } a > -8$$

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



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Unit 3

SKILL CHECK - ANSWER KEY

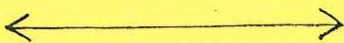
① $3(n-1) > 4n-7$
 $3n-3 > 4n-7$
 $-n > -4$

$n < 4$



② $\frac{n}{2} + 4 \leq 2(n-1) - \frac{3n}{2}$
 $2\left[\frac{n}{2} + 4 \leq 2n-2 - \frac{3n}{2}\right]$
 $n+8 \leq 4n-4-3n$
 $n+8 \leq n-4$
 $8 \leq -4$ false ineq.

no solutions



③ $\frac{2(x+1)}{3} < \frac{3x+1}{4}$

$\frac{2x+2}{3} < \frac{3x+1}{4}$

$4(2x+2) < 3(3x+1)$
 $8x+8 < 9x+3$
 $-x < -5$

$x > 5$



④ $2a < 6$ and $3a \geq -9$
 $a < 3$ and $a \geq -3$

$-3 \leq a < 3$

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 $n < 1$

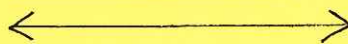
$-11 < n < 1$



⑥ $4(x+4) \leq 4x+8 \leq 2(2x+5)$
 $4x+16 \leq 4x+8 \leq 4x+10$
 Subtract $4x$

$16 \leq 8 \leq 10$
 false inequality

no solutions



⑦ $3n+4 \leq -2$ or $2n-5 \geq 3$
 $3n \leq -6$ or $2n \geq 8$

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



⑧ $n < -1$ or $n > 8$
 union

⑨ $n = \text{an even integer}$

$-12 < 4n-3 < 7$

add 3
 $-9 < 4n < 10$
 divide by 4

$-\frac{9}{4} < n < \frac{10}{4}$

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

$n = -2, 0, 2$

⑩ $n = \text{Sales}$

$16,960 < 16,000 + .08n < 21,600$

$960 < .08n < 5,600$

$12,000 < n < 70,000$

between \$12,000 and \$70,000

⑪ n

5	7	9
7	9	11

$2 \leq 2n - (n+2) \leq 8$

$2 \leq 2n - n - 2 \leq 8$

$2 \leq n - 2 \leq 8$

$4 \leq n \leq 10$

n is odd = 5, 7, 9

⑫ $x-3 \leq 3x+5 \leq 2x+8$

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

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

$-8 \leq 2x$ and $x \leq 3$

$-4 \leq x \leq 3$ and $x \neq -1$



⑬ $|2n-4| - 2 \geq 4$

$|2n-4| \geq 6$

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

$2n \geq 10$ or $2n \leq -2$

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



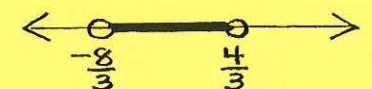
⑭ $|3x+2| + 4 < 10$

$|3x+2| < 6$

$3x+2 < 6$ and $3x+2 > -6$

$3x < 4$ and $3x > -8$

$-\frac{8}{3} < x < \frac{4}{3}$



Unit 3

REMEDICATION - ANSWER KEY

① $2(a-3) \leq 5a-3$
 $2a-6 \leq 5a-3$
 $-3a \leq 3$

$a \geq 1$



② $\left[\frac{2n}{3} - 1 > n - 4 \right] \cdot 3$

$2n - 3 > 3n - 12$
 $-n > -9$ $n < 9$



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

all solutions



④ $5n-1 \leq 14$ and $2n+3 > -1$
 $5n \leq 15$ and $2n > -4$
 $n \leq 3$ and $n > -2$

$-2 < n \leq 3$

⑤ $2x-6 \leq 3x+4 < x+12$
 subtract 4

$2x-10 \leq 3x < x+8$

$2x-10 \leq 3x$ and $3x < x+8$

$-10 \leq x$ and $2x \leq 8$

$-10 \leq x$ and $x \leq 4$

$-10 \leq x \leq 4$



⑥ $2(4n-1) < 8n+5 < 4(6n+3)$
 $8n-2 < 8n+5 < 8n+12$
 $-2 < 5 < 12$ identity

all solutions



⑦ $3a+1 < -5$ or $2a+6 < 3a-2$
 $3a < -6$ or $-a < -8$

$a < -2$ or $a > 8$



⑧ $-4 < n \leq 0$
 intersection

⑨ $n = \text{odd integer}$

$-4 \leq 2n+3 \leq 10$

$-7 \leq 2n \leq 7$

$-\frac{7}{2} \leq n \leq \frac{7}{2}$

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

⑩ $n = \text{total sales}$

$16,820 < 12,500 + .12n < 25,460$

$4320 < .12n < 12,960$

$36,000 < n < 108,000$

between \$36,000 and \$108,000

⑪

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

$-10 < (n+2) + 2(n+4) < 12$

$-10 < 3n+10 < 12$

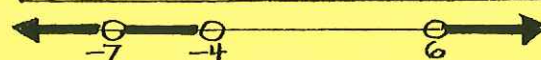
$-20 < 3n < 2$

$-\frac{20}{3} < n < \frac{2}{3}$ n is even $-6, -4, -2, 0$

⑫ $[3n < n-8$ or $2n > n+6]$ and $n \neq -7$

$(2n < -8$ or $n > 6)$ and $n \neq -7$

$(n < -4$ or $n > 6)$ and $n \neq -7$



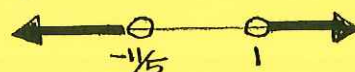
⑬ $|5x+3| - 1 > 7$

$|5x+3| > 8$

$5x+3 > 8$ or $5x+3 < -8$

$5x > 5$ or $5x < -11$

$x > 1$ or $x < -\frac{11}{5}$



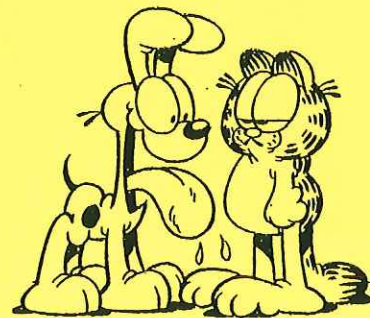
⑭ $|2n-5| + 3 \leq 6$

$|2n-5| \leq 3$

$2n-5 \leq 3$ and $2n-5 \geq -3$

$2n \leq 8$ and $2n \geq 2$

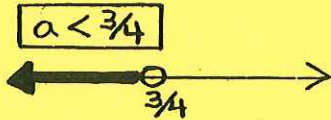
$1 \leq n \leq 4$



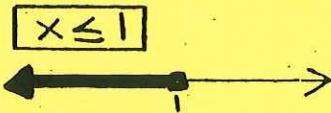
Unit 3

EXTRA PRACTICE - ANSWER KEY

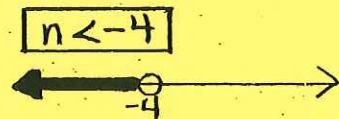
① $2(4a-6) < -6$
 $8a - 12 < -6$
 $8a < 6$



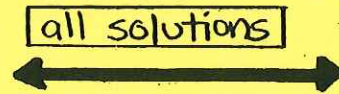
② $-3(x-2) \geq 2(x-1)+3$
 $-3x+6 \geq 2x-2+3$
 $-3x+6 \geq 2x+1$
 $-5x \geq -5$



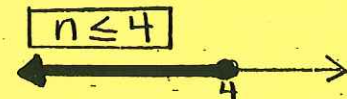
③ $2(n+3) < \frac{n}{4} - 1$
 $4[2n+6 < \frac{n}{4} - 1]$
 $8n+24 < n-4$
 $7n < -28$



④ $-3(3x+2) \geq 2(x-3) - 11x$
 $-9x-6 \geq 2x-6-11x$
 $-6 \geq -6$ identity



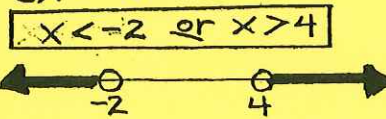
⑤ $\frac{2n+7}{3} \geq \frac{3(3n-2)}{6}$
 $6(2n+7) \geq 9(3n-2)$
 $12n+42 \geq 27n-18$
 $-15n \geq -60$



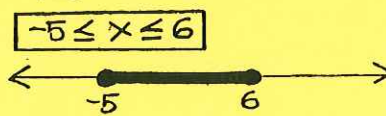
⑥ $x > -2$ and $x < 4$



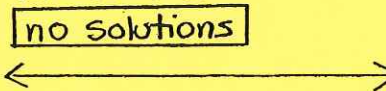
⑦ $3x-2 < -8$ or $x-7 > -3$
 $3x < -6$



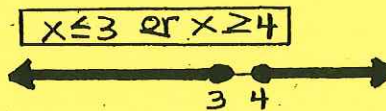
⑧ $x+4 \leq 2x+9 \leq x+15$
 $4 \leq x+9 \leq 15$



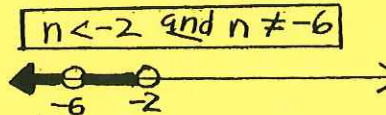
⑨ $6n+5 < 2(3n+4) < 3(2n-1)$
 $6n+5 < 6n+8 < 6n-3$
 $5 < 8 < -3$



⑩ $x \geq 4x-9$ or $2x \geq x+4$
 $-3x \geq -9$ or $x \geq 4$



⑪ $n-8 > 3n-4$ and $n \neq -6$
 $-2n > 4$

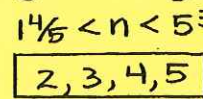


⑫ union
 $x < -2$ or $x > 4$

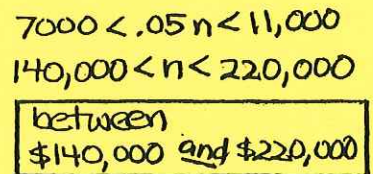
⑬ intersection
 $-7 \leq x \leq 1$

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 = 6

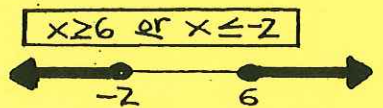
⑮ $6 < 5n-3 < 25$
 $9 < 5n < 28$
 $\frac{9}{5} < n < \frac{28}{5}$



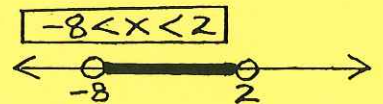
⑯ $21,200 < 14,200 + .05n$
 $< 25,200$



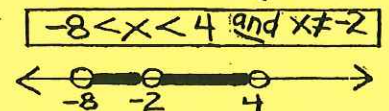
⑰ $|3x-6| \geq 12$
 $3x-6 \geq 12$ or $3x-6 \leq -12$
 $3x \geq 18$ or $3x \leq -6$



⑱ $|2x+6| - 4 < 6$
 $|2x+6| < 10$
 $2x+6 < 10$ and $2x+6 > -10$
 $2x < 4$ and $2x > -16$
 $x < 2$ and $x > -8$



⑲ $x-3 < 2x+5 < x+9$
 $-3 < x+5 < 9$ and $x \neq -2$



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



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

$$3n - 4 = 24n + 80$$

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

⑨ $5(3n-2) = 4(n+4) + 3n-2$

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

$$15n - 10 = 7n + 14$$

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

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

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

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

$$12n + 60 < 36n - 12$$

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

sign flips,
multiply
by neg.

⑪ $2n - 9 \leq 3n - 4 < n + 8$

$$2n - 9 \leq 3n - 4 \quad \text{and} \quad 3n - 4 < n + 8$$

$$-5 \leq n \quad \text{and} \quad 2n < 12$$

$$n < 6$$

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



⑫ $2x + 3 \leq 7$ or $3(x-4) > 6$

$$2x \leq 4$$

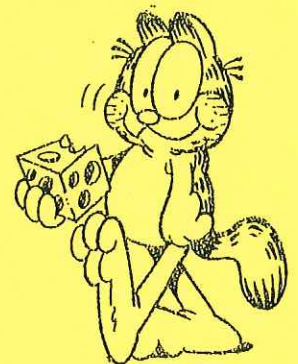
$$x \leq 2$$

$$3x - 12 > 6$$

$$3x > 18$$

$$x > 6$$

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



$$\begin{aligned} 13) \quad 3n - 2m &= mn + 4 \\ 3n - mn &= 2m + 4 \\ n(3 - m) &= 2m + 4 \end{aligned}$$

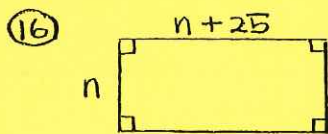
$$n = \frac{2m+4}{3-m} \text{ for } m \neq 3$$

$$14) \quad \begin{array}{l} \text{now} \quad 6 \text{ ago} \quad \text{in 2} \\ \text{Mrs. B} \quad 4n \quad 4n-6 \\ \text{Nick} \quad n \quad n+2 \end{array}$$

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

$$15) \quad 2n + 12 = 3n - 31 \quad \boxed{43}$$

$$43 = n$$



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

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

$$104.5n = 8569$$

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

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

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

$$19) \quad 8 < 3n - 2 < 24$$

$$10 < 3n < 26$$

$$\frac{10}{3} < n < \frac{26}{3} \quad \boxed{4, 6, 8}$$

$$n = \text{even, between } 3\frac{1}{3} \text{ and } 8\frac{2}{3}$$

$$20) \quad .04n + 400 = 520$$

$$.04n = 120$$

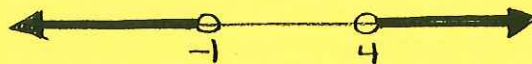
$$n = 3000 \quad \boxed{\$3000}$$

$$21) \quad |4n - 6| > 10$$

$$4n - 6 > 10 \text{ or } 4n - 6 < -10$$

$$4n > 16 \text{ or } 4n < -4$$

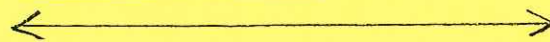
$$n > 4 \text{ or } n < -1$$



$$22) \quad |n| - 3 \leq -4$$

$$|n| \leq -1 \quad \leftarrow \text{impossible}$$

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



$$23) \quad |n - 5| + 3 < 8$$

$$|n - 5| < 5$$

$$n - 5 < 5 \text{ and } n - 5 > -5$$

$$n < 10 \text{ and } n > 0$$

$$\boxed{0 < n < 10}$$



"B"

Cumulative Review Answer Key



- ① Multiplicative Inverse
- ② Symmetric Property of Equality
- ③ $(n-3)(n^2+2)$
- ④ $-x^2 - 3xy$
 $-(-1)^2 - 3(-1)(4)$
 $-(-1) - (-12)$ \rightarrow $-1 + 12$
 $\boxed{11}$

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

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

$$\textcircled{6} 3x(2y-x) - 2x(3x+y)$$

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

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

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

divide by 4

$$\textcircled{8} 3(a-4) - 5a = a+3$$

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

$$-2a - 12 = a + 3$$

$$-3a = 15$$

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

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

$$12 - 3n = 18 - 4n$$

$$\boxed{n = 6}$$

$$\textcircled{10} 4(x-3) \geq 8(x-1)$$

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

$$-4x \geq 4$$

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

$$\textcircled{11} n+6 < 3n+10 \leq n+16$$

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

subtract 10 then

subtract n

$$-4 < 2n \leq 6$$

divide by 2

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



$$\textcircled{12} a-3 \leq 4 \text{ or } 3(a-2) < 5a-2$$

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

$$-2a < 4$$

$$a \leq 7 \text{ or } a > -2$$

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

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



$$\textcircled{13} 4(x-3y) = xy + y^2$$

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

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

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

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

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

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

$$2n-6 = 3n-12$$

$$-n = -6$$

$$n = 6 \quad 2n = 12$$

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

$\textcircled{15}$	n	-4	
	n+2	$\boxed{-2}$	←
	n+4	0	

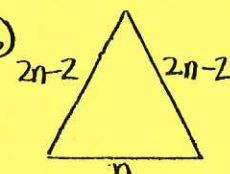
$$2n - 3(n+2) = -2$$

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

$$-n = 4$$

$$n = -4$$



$\textcircled{16}$		$(2n-2) + (2n-2) + n = 26$
		$5n - 4 = 26$
		$5n = 30$
		$n = 6$
		$\boxed{6 \text{ in.}}$

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

$$100n = 3150$$

$$\boxed{31.5}$$

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

$$15n = 1080$$

$$n = 72$$

$$72 - 10.80 = \boxed{\$61.20}$$

$$\textcircled{19} -7 < 4n + 6 < 19$$

$$-13 < 4n < 13$$

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

$$n = \boxed{-3, -1}$$



$$\textcircled{20} .05n + 3(225) = 815$$

$$.05n + 675 = 815$$

$$.05n = 140$$

$$n = \boxed{\$2800}$$

$$\textcircled{21} |6x - 6| - 2 \leq 16$$

$$|6x - 6| \leq 18$$

$$6x - 6 \leq 18 \text{ and } 6x - 6 \geq -18$$

$$6x \leq 24 \text{ and } 6x \geq -12$$

$$x \leq 4 \text{ and } x \geq -2$$

$$\boxed{-2 \leq x \leq 4}$$



$$\textcircled{22} |n - 1| + 4 > 2$$

$$|n - 1| > -2$$

absolute value must be greater than or = 0

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



$$\textcircled{23} |3n - 6| > 15$$

$$3n - 6 > 15 \text{ or } 3n - 6 < -15$$

$$3n > 21 \text{ or } 3n < -9$$

$$n > 7 \text{ or } n < -3$$

$$\boxed{n > 7 \text{ or } n < -3}$$



"C"

Cumulative Review Answer Key

① Commutative Property of Addition

② Additive Inverse

$$\textcircled{3} n^3 - (4n - 3)$$

$$\textcircled{4} abc - 2bc^3$$

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

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

$$(4) - (4) = \boxed{0}$$

$$\textcircled{5} 4bc - 2(ab^2 - 1)$$

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

$$(8) - 2(7)$$

$$(8) - (14) = \boxed{-6}$$

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

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

$$\boxed{6ab - 11a^2}$$

$$\textcircled{7} 3x(2x - y) - 4x^2 - 3(x^2 - xy)$$

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

$$\boxed{-x^2}$$

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

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

$$-10 = 10n$$

$$\boxed{n = -1}$$

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

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

$$12x - 24 = x - 2$$

$$11x = 22$$

$$\boxed{x = 2}$$

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

$$\begin{aligned} 9(2n-6) &> 6(4n-4) \\ 18n-54 &> 24n-24 \\ -6n &> 30 \quad \text{sign flip} \\ \boxed{n < -5} \end{aligned}$$

$$\textcircled{11} x-1 \leq 3x+7 < 2x+8$$

$$\begin{aligned} x-8 &\leq 3x < 2x+1 \\ x-8 &\leq 3x \quad \text{and} \quad 3x < 2x+1 \\ -8 &\leq 2x \quad \text{and} \quad x < 1 \\ \boxed{-4 \leq x < 1} \end{aligned}$$



$$\textcircled{12} 3n-4 > 11 \quad \text{or} \quad 2n-4 < -2$$

$$\begin{aligned} 3n &> 15 \quad \text{or} \quad 2n < 2 \\ \boxed{n > 5 \quad \text{or} \quad n < 1} \end{aligned}$$



$$\textcircled{13} 5x-3n = x^2-2mn$$

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

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

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

$$\textcircled{14} \begin{array}{l} \text{Mrs. McCann} \quad \text{now} \quad \text{in 6} \\ \quad \quad \quad n \quad \quad n+6 \\ \text{Arthur} \quad 57-n \quad 63-n \end{array}$$

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

$$n+6 = 126-2n$$

$$3n = 120$$

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

$$\textcircled{15} 5n - (-2) = -13$$

$$5n + 2 = -13$$

$$5n = -15$$

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

$$\textcircled{16} \quad \begin{array}{l} n+4 \\ \text{ } \\ n \end{array} \quad \begin{array}{l} 2n+2(n+4) = 52 \\ 4n = 44 \\ n = 11 \end{array} \quad \boxed{11 \text{ by } 15 \text{ ft.}}$$



$$\textcircled{17} \frac{\text{part}}{\text{whole}} = \frac{15}{n} = \frac{18}{100} \quad \begin{array}{l} 18n = 1500 \\ n = \boxed{83.3} \end{array}$$

$$\textcircled{18} \frac{\text{purch pr}}{\text{org pr}} = \frac{51.20}{n} = \frac{80}{100} \quad \begin{array}{l} 80n = 5120 \\ n = 64 \end{array}$$

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

$$\textcircled{19} -7 < 4n+1 < 26$$

$$-8 < 4n < 25$$

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

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

$$\textcircled{20} .075n + 2(75) = 725$$

$$.075n + 350 = 725$$

$$.075n = 375$$

$$n = 5000$$

$$\boxed{\$5000}$$

$$\textcircled{21} |x| + 3 < 2 \quad \boxed{\text{no solutions}}$$

$$|x| < -1$$

absolute value must be ≥ 0

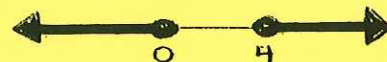
$$\textcircled{22} |5n-10| + 15 \geq 25$$

$$|5n-10| \geq 10$$

$$5n-10 \geq 10 \quad \text{or} \quad 5n-10 \leq -10$$

$$5n \geq 20 \quad \text{or} \quad 5n \leq 0$$

$$\boxed{n \geq 4 \quad \text{or} \quad n \leq 0}$$



$$\textcircled{23} |3n| - 6 < 12$$

$$|3n| < 18$$

$$3n < 18 \quad \text{and} \quad 3n > -18$$

$$n < 6 \quad \text{and} \quad n > -6$$

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



Quarterly Exam #1

REMEDICATION & 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 $\frac{3x+7}{2} = x+1$

$3x+7 = 2x+2$

$x = -5$



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

$3[3n - \frac{2n}{3} = 2n+2]$

$9n - 2n = 6n+6$

$n = 6$

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

$6(4x-3) > 10x+10$

$24x - 18 > 10x + 10$

$14x > 28 \quad x > 2$



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

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

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

$$2n \leq 12$$

$$n \leq 6$$

$$\textcircled{10} \quad 2y+5x = xy+3$$

$$5x-xy = 3-2y$$

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

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

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

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

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

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

$$\textcircled{11} \quad x-4 < 3x+2 \leq x+8$$

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

$$-6 < 2x \text{ and } 2x \leq 6$$

$$-3 < x \text{ and } x \leq 3$$

$$-3 < x \leq 3$$



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

$$2x-6 \leq 3x+8 \text{ and } 3x+8 \leq x+14$$

$$-14 \leq x \text{ and } 2x \leq 6$$

$$x \leq 3$$

$$-14 \leq x \leq 3$$



$$\textcircled{12} \quad 2n-5 > 9 \text{ or } 3n-5 < 7$$

$$2n > 14 \text{ or } 3n < 12$$

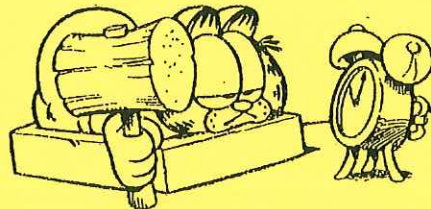
$$n > 7 \text{ or } n < 4$$



$$n+3 \leq -5 \text{ or } 2n-3 \geq 7$$

$$n \leq -8 \text{ or } 2n \geq 10$$

$$n \geq 5$$



$$\textcircled{13} \quad |2n-5| \geq 7$$

$$2n-5 \geq 7 \text{ or } 2n-5 \leq -7$$

$$2n \geq 12 \text{ or } 2n \leq -2$$

$$n \geq 6 \text{ or } n \leq -1$$

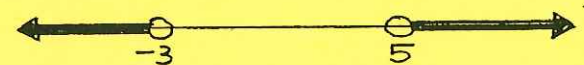


$$|3n-3| > 12$$

$$3n-3 > 12 \text{ or } 3n-3 < -12$$

$$3n > 15 \text{ or } 3n < -9$$

$$n > 5 \text{ or } n < -3$$



$$\textcircled{14} \quad |2n-5| - 8 < 3$$

$$|2n-5| < 11$$

$$2n-5 < 11 \text{ and } 2n-5 > -11$$

$$2n < 16$$

$$2n > -6$$

$$n < 8$$

$$n > -3$$

$$-3 < n < 8$$



$$|n+2| - 6 \leq 4$$

$$|n+2| \leq 10$$

$$n+2 \leq 10 \text{ and } n+2 \geq -10$$

$$n \leq 8$$

$$n \geq -12$$

$$-12 \leq n \leq 8$$



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

$$4n + 8 = n - 1 \quad 2n - 3 = 4n + 7$$

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

$$n = -3 \quad n = -5$$

⑰

n	$2n+2$
-----	--------

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

$$2n + 4n + 4 = 22$$

$$6n = 18$$

$$n = 3$$

dimensions: 3 by 8
area = 24 in^2

n	$3n-3$
-----	--------

$$2(n) + 2(3n-3) = 34$$

$$2n + 6n - 6 = 34$$

$$8n = 40$$

$$n = 5$$

dimensions 5 by 12 in.
area = 60 in^2

⑱

sale pr.	$\frac{15.64}{n}$	$=$	$\frac{85}{100}$
org. pr.	n		

$$85n = 1564$$

$$n = 18.4$$

Savings: $\$18.40 - \15.64
 $\$2.76$

Coupon pr.	$\frac{9.12}{n}$	$=$	$\frac{95}{100}$
org. pr	n		

$$95n = 912$$

$$n = 9.6$$

org. price: $\$9.60$

⑲

$$-9 < 2n + 6 < 10$$

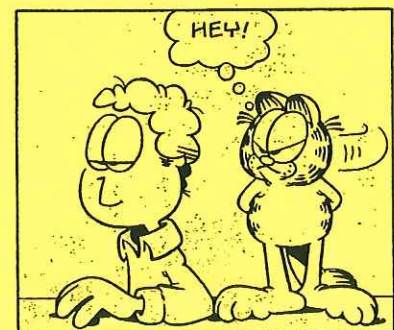
$$-9 < 2n + 6 \text{ and } 2n + 6 < 10$$

$$-15 < 2n \text{ and } 2n < 4$$

$$-\frac{15}{2} < n \text{ and } n < 2$$

$$-\frac{15}{2} < n < 2$$

negative, even: $-6, -4, -2$



$$-12 < 3n + 1 < 11$$

$$-12 < 3n + 1 \text{ and } 3n + 1 < 11$$

$$-13 < 3n \text{ and } 3n < 10$$

$$-\frac{13}{3} < n \text{ and } n < \frac{10}{3}$$

$$-\frac{13}{3} < n < \frac{10}{3}$$

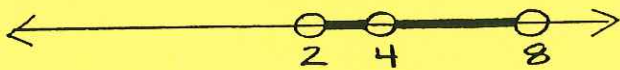
positive, odd: 1, 3

② $180 + .12n = 708$
 $.12n = 528$
 $n = 4400$
 Sales: \$4400

$2(120) + .04n = 631.20$
 $240 + .04n = 631.20$
 $.04n = 391.2$
 $n = 9780$
 Sales: \$9780



② $|x - 5| < 3$ and $x \neq 4$
 $[x - 5 < 3 \text{ and } x - 5 > -3]$ and $x \neq 4$
 $[x < 8 \text{ and } x > 2]$ and $x \neq 4$
 $(2 < x < 8)$ and $x \neq 4$



$|2x - 3| \geq 7$ and $x \neq 7$
 $[2x - 3 \geq 7 \text{ or } 2x - 3 \leq -7]$ and $x \neq 7$
 $[2x \geq 10 \text{ or } 2x \leq -4]$ and $x \neq 7$
 $(x \geq 5 \text{ or } x \leq -2)$ and $x \neq 7$



