

Algebra Skills Review

"A"

Alg. Skills Review Answer Key

① Commutative Property of Multiplication

② Reflexive Property of Equality

$$\frac{2a^2 - b^3}{b(b-c)} = \frac{2(-2)^2 - (-1)^3}{(-1)[(-1) - (-2)]}$$

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

④ $3xn - 2xy = y^2(n-x)$
 $3xn - 2xy = y^2n - y^2x$
 $3xn - y^2n = 2xy - y^2x$
 $n(3x - y^2) = 2xy - y^2x$

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

⑤ $2x - \frac{2x}{3} < 4(x-6)$

$$\left[2x - \frac{2x}{3} < 4x - 24\right] (3)$$

$$6x - 2x < 12x - 72$$

$$-8x < -72$$

$$\boxed{x > 9}$$

⑥ $|2n-4| > 10$

$$2n-4 > 10 \text{ or } 2n-4 < -10$$

$$2n > 14 \text{ or } 2n < -6$$

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



⑦ $|n-7| - 1 \leq 2$ and $n \neq 5$

$$|n-7| \leq 3$$

$$(n-7 \leq 3 \text{ and } n-7 \geq -3) \text{ and } (n \neq 5)$$

$$(n \leq 10 \text{ and } n \geq 4) \text{ and } (n \neq 5)$$

$$\boxed{(4 \leq n \leq 10) \text{ and } (n \neq 5)}$$



⑧ $(4a^2b^{-3}c)^2 \left(-\frac{1}{2}a^{-3}bc^2\right)^3$
 $(16a^4b^{-6}c^2) \left(-\frac{1}{8}a^{-9}b^3c^6\right)$
 $-2a^{-5}b^{-3}c^8$

$$\boxed{\frac{-2c^8}{a^5b^3}}$$



⑨ $\frac{-8x^{-3}y^2z^2}{6x^{-5}y^4z^{-3}} = \boxed{\frac{-4x^2z^5}{3y^3}}$

⑩ $\frac{-9a^2x^{2n-1}}{3ax^{n+2}} = -3ax^{(2n-1)-(n+2)}$

$$\boxed{-3ax^{n-3}}$$

⑪ $(4x-3y)(x+5y)$

$$\boxed{4x^2 + 17xy - 15y^2}$$

⑫ $(2a^x - 3b^{2x+1})^2$

$$\boxed{4a^{2x} - 12a^x b^{2x+1} + 9b^{4x+2}}$$

⑬ $a-2b \overline{) 3a^2 + 6ab + 12b^2 + \frac{23b^3}{a-2b}}$

$$3a^3 \quad \underline{\hspace{2em}}$$

$$3a^3 - 6a^2b \quad \underline{\hspace{2em}}$$

$$6a^2b$$

$$6a^2b - 12ab^2 \quad \underline{\hspace{2em}}$$

$$12ab^2 - b^3$$

$$12ab^2 - 24b^3 \quad \underline{\hspace{2em}}$$

$$23b^3$$



$$\textcircled{14} \frac{210 \times 10^{-3}}{.14 \times 10^4} = 1500 \times 10^{-7}$$

$$\boxed{1.5 \times 10^{-4}}$$

$$\textcircled{15} 32mn^5 - 2m^5n$$

$$2mn(16n^4 - m^4)$$

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

$$\boxed{2mn(4n^2 + m^2)(2n + m)(2n - m)}$$

$$\textcircled{16} 8a^2 - 2ab - b^2$$

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

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

$$\boxed{(2a - b)(4a + b)}$$

$$\textcircled{17} 16x^2 - 16y^2 + a^2y^2 - a^2x^2$$

$$16(x^2 - y^2) + a^2(y^2 - x^2)$$

$$16(x^2 - y^2) - a^2(x^2 - y^2)$$

$$(x^2 - y^2)(16 - a^2)$$

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

$$\textcircled{18} 24a = -9a^2 - 16$$

$$9a^2 + 24a + 16 = 0$$

$$(3a + 4)^2 = 0$$

$$\boxed{a = -\frac{4}{3}}$$

$$\textcircled{19} 2n^3 - 12n = -5n^2$$

$$2n^3 + 5n^2 - 12n = 0$$

$$n(2n^2 + 5n - 12) = 0$$

$$n(2n^2 + 8n - 3n - 12) = 0$$

$$n[2n(n + 4) - 3(n + 4)] = 0$$

$$n(n + 4)(2n - 3) = 0$$

$$\boxed{n = 0, -4, \frac{3}{2}}$$

$$\textcircled{20} f(x) = 2x^2 - 3x$$

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

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

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

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

$$\textcircled{21} \frac{(-2, 3) - (-5, 4)}{(-2) - (-5)} = \frac{3 - 4}{-2 - (-5)} = \frac{-1}{3}$$

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

$$x + 3y = C$$

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

$$\boxed{x + 3y = 7}$$

$$(0, \frac{7}{3})$$

y-int $\frac{c}{B}$

$$(\frac{7}{3}, 0)$$

x-int $\frac{c}{A}$



$$\textcircled{22} \frac{(-2, 5) - (-5, 7)}{(-2) - (-5)} = \frac{5 - 7}{-2 - (-5)} = \frac{-2}{3}$$

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

$$(5) = \frac{-2}{3}(-2) + b$$

$$5 = \frac{4}{3} + b \quad b = \frac{11}{3}$$

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

$$\textcircled{23} \left[\frac{2}{3}y = \frac{2}{3}x - 2 \right] (3)$$

$$(2y = 2x - 6) \div 2$$

$$y = x - 3$$

$$-4x + y = -3$$

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

$$\text{slope } \frac{-A}{B} = 4$$

$$\text{y-int } \frac{c}{B} = (0, -3)$$

$$\text{x-int } \frac{c}{A} = (\frac{3}{4}, 0)$$



24) $(4, -7)$ $m = -3$
 point-slope form
 $y - y_1 = m(x - x_1)$

$$y + 7 = -3(x - 4)$$

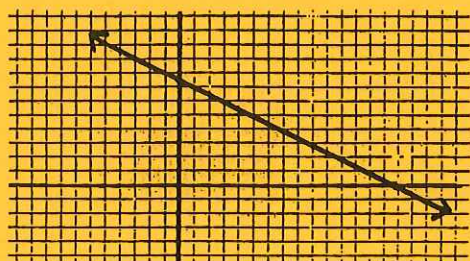
25) $y = 2x - 5$ $m = 2$ $(1, 7)$
 \perp slope $= -\frac{1}{2}$

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

$$7 = -\frac{1}{2}(1) + b$$

$$7 = -\frac{1}{2} + b \quad b = \frac{15}{2}$$

$$y = -\frac{1}{2}x + \frac{15}{2}$$



26) $(4, -6)$ $(-2, 8)$ midpoint
 $\frac{4 + (-2)}{2}, \frac{(-6) + 8}{2}$ $(1, 1)$

27) $y = 3x - 5$ slope $= 3$
 $2x - y = 5$ slope $= 2$

independent, consistent, 1

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

$$x = 4$$

$$y = 2(4) - 1 = 7 \quad (4, 7)$$

29) $3m + 2n = 10$ $\times 3$
 $4m - 3n = -32$ $\times 2$

$$9m + 6n = 30$$

$$8m - 6n = -64$$

$$17m = -34$$

$$m = -2$$

$$3(-2) + 2n = 10$$

$$n = 8$$

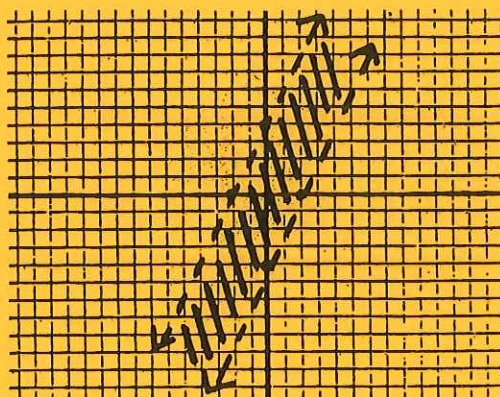
$$(-2, 8)$$

30) $|2x - y| < 4$

$$2x - y < 4 \quad \text{and} \quad 2x - y > -4$$

$$-y < -2x + 4 \quad \text{and} \quad -y > -2x - 4$$

$$y > 2x - 4 \quad \text{and} \quad y < 2x + 4$$



"B"

Alg. Skills Review Answer Key



① Zero Property

② Transitive Property of Equality

③ $2x^2 - 3y(x - 2z)$
 $2(-3)^2 - 3(-2)[(-3) - 2(-1)]$
 $2(9) - (-6)[(-3) + 2]$
 $18 - (-6)(-1) = 18 - 6 = 12$

④ $3y(x - 2y) = 2(x - y^2)$
 $3xy - 6y^2 = 2x - 2y^2$
 $3xy - 2x = -2y^2 + 6y^2$
 $x(3y - 2) = 4y^2$

$$x = \frac{4y^2}{3y - 2} \quad \text{for } 3y - 2 \neq 0$$

$$\textcircled{5} \frac{3n-4}{10} > \frac{2(n-3)}{5}$$

$$\frac{3n-4}{10} > \frac{2n-6}{5}$$

$$5(3n-4) > 10(2n-6)$$

$$15n-20 > 20n-60$$

$$-5n > -40$$

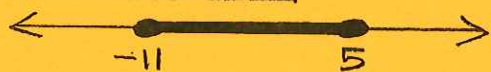
$$\boxed{n < 8} \quad \text{sign flip}$$

$$\textcircled{6} |n+3| \leq 8$$

$$n+3 \leq 8 \quad \text{and} \quad n+3 \geq -8$$

$$n \leq 5 \quad \text{and} \quad n \geq -11$$

$$\boxed{-11 \leq n \leq 5}$$



$$\textcircled{7} |n-4| > 2 \quad \text{and} \quad n \geq 0$$

$$(n-4 > 2 \quad \text{or} \quad n-4 < -2) \quad \text{and} \quad (n \geq 0)$$

$$\boxed{(n > 6 \quad \text{or} \quad n < 2) \quad \text{and} \quad (n \geq 0)}$$



$$\textcircled{8} (-3x^2y^3z^{-1})^2 \left(\frac{1}{3}x^3y^{-1}z^{-2}\right)^3$$

$$(9x^4y^6z^2) \left(\frac{1}{27}x^9y^{-3}z^{-6}\right)$$

$$-\frac{1}{3}x^{13}y^3z^{-8}$$

$$\boxed{\frac{-x^{13}y^3}{3z^8}}$$

$$\textcircled{9} \frac{27a^{-2}b^3c^{-1}d}{-18ab^{-4}c^2d^3} = \boxed{\frac{-3b^7}{2a^3c^3d^2}}$$

$$\textcircled{10} \frac{14n^2x^{3a-1}}{-2nx^{a+4}} = -7x^{(3a-1)-(a+4)}$$

$$\boxed{-7nx^{2a-5}}$$

$$\textcircled{11} (a-4b)(2a+b)$$

$$\boxed{2a^2 - 7ab - 4b^2}$$

$$\textcircled{12} (x^{2n} + 3y^{n-1})^2$$

$$\boxed{x^{4n} + 6x^{2n}y^{n-1} + 9y^{2n-2}}$$

$$\textcircled{13} a+3b \begin{array}{r} 4a^2 - 12ab + 36b^2 - \frac{109b^3}{a+3b} \\ \underline{4a^3 - b^3} \\ 4a^3 + 12a^2b \\ \underline{-12a^2b} \\ -12a^2b - 36ab^2 \\ \underline{36ab^2 - b^3} \\ 36ab^2 + 108b^3 \\ \underline{-108b^3} \end{array}$$



$$\textcircled{14} (.03 \times 10^{-4})(.05 \times 10^{-2})$$

$$.0015 \times 10^{-6} = \boxed{1.5 \times 10^{-9}}$$

$$\textcircled{15} n^8 - 1$$

$$(n^4+1)(n^4-1)$$

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

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

$$\textcircled{16} 4x^3 + 2x^2y - 12xy^2$$

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

$$2x(2x^2 + 4xy - 3xy - 6y^2)$$

$$2x[2x(x+2y) - 3y(x+2y)]$$

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

$$\textcircled{17} (a+b)^2 - 3(a+b) - 4$$

$$[(a+b)-4][(a+b)+1]$$

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

$$\textcircled{18} 13x = -10 - 4x^2$$

$$4x^2 + 13x + 10 = 0$$

$$4x^2 + 8x + 5x + 10 = 0$$

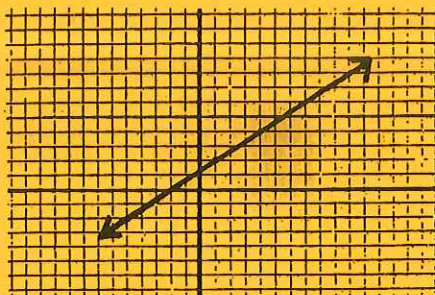
$$4x(x+2) + 5(x+2) = 0$$

$$(x+2)(4x+5) = 0$$

$$\boxed{x = -2, -5/4}$$

$$\begin{aligned} (19) \quad n^5 - 10n^3 + 9n &= 0 \\ n(n^4 - 10n^2 + 9) &= 0 \\ n(n^2 - 9)(n^2 - 1) &= 0 \\ n(n+3)(n-3)(n+1)(n-1) &= 0 \end{aligned}$$

$$\boxed{n = 0, -3, 3, -1, 1}$$



$$\begin{aligned} (20) \quad f(x) &= 2x - x^2 \\ f(2n-1) &= 2(2n-1) - (2n-1)^2 \\ 4n-2 - (4n^2 - 4n + 1) & \\ 4n-2 - 4n^2 + 4n - 1 & \end{aligned}$$

$$\boxed{-4n^2 + 8n - 3}$$

$$(24) \quad \frac{(-2, 7) \quad 7-3}{(-4, 3) \quad (-2)-(-4)} = \frac{4}{2} = 2$$

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

$$\begin{aligned} (21) \quad (4, -2) \quad m &= \frac{2}{3} \\ y &= \frac{2}{3}x + b \\ (-2) &= \frac{2}{3}(4) + b \\ -2 &= \frac{8}{3} + b \\ -\frac{14}{3} &= b \end{aligned}$$



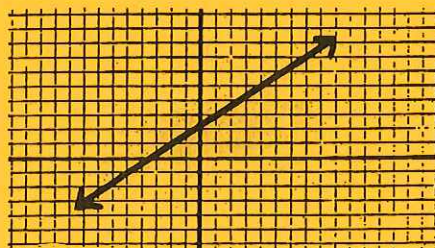
$$\boxed{\begin{aligned} y &= \frac{2}{3}x - \frac{14}{3} \\ y\text{-int } (b) &= (0, -\frac{14}{3}) \\ x\text{-int } (\frac{-b}{m}) &= (7, 0) \end{aligned}}$$

$$(25) \quad y = \frac{2}{3}x - 3 \quad m = \frac{2}{3} \quad (-3, 1)$$

$$\frac{2}{3} = \frac{A}{-B} \quad \begin{aligned} A &= 2 \\ B &= -3 \end{aligned}$$

$$\begin{aligned} 2x - 3y &= C \\ 2(-2) - 3(1) &= -7 \end{aligned}$$

$$\boxed{2x - 3y = -7}$$



$$(22) \quad \frac{(3, -2) \quad (-2)-0}{(-1, 0) \quad 3-(-1)} = \frac{-2}{4} = -\frac{1}{2}$$

$$\frac{-1}{2} = \frac{-A}{B} \quad \begin{aligned} A &= 1 \\ B &= 2 \end{aligned}$$

$$\begin{aligned} x + 2y &= C \\ (3) + 2(-2) &= -1 \end{aligned}$$

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

$$(26) \quad (-5, 8) \quad (-7, -2) \text{ midpoint}$$

$$\frac{(-5)+(-7)}{2}, \frac{8+(-2)}{2} \quad \boxed{(-6, 3)}$$

$$\begin{aligned} (23) \quad 9y - 12 &= 6x \\ -6x + 9y &= 12 \\ 6x - 9y &= -12 \end{aligned}$$

$$\boxed{\begin{aligned} 2x - 3y &= -4 \\ \text{slope } \frac{-A}{B} &= \frac{2}{3} \\ y\text{-int } \frac{C}{B} &= (0, \frac{4}{3}) \\ x\text{-int } \frac{C}{A} &= (-2, 0) \end{aligned}}$$

$$(27) \quad y = \frac{-3}{5}x + 1 \quad m = -\frac{3}{5} \quad (0, 1)$$

$$3x + 5y = 5 \quad m = -\frac{3}{5} \quad (0, 1)$$

Same line

$\boxed{\text{consistent, dependent, inf}}$



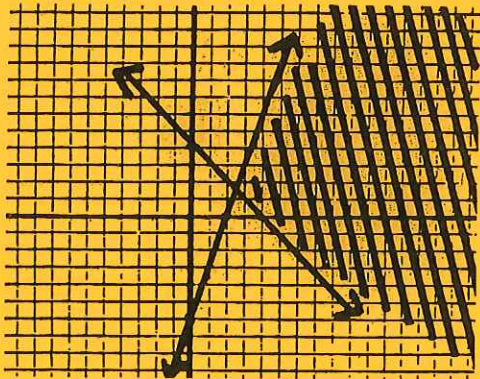
$$\begin{aligned} \textcircled{28} \quad 3x + y &= 1 & y &= 1 - 3x \\ x - 2y &= 12 \\ x - 2(1 - 3x) &= 12 \\ x - 2 + 6x &= 12 \\ 7x &= 14 & \boxed{(2, -5)} \\ x &= 2 \\ y &= 1 - 3(2) = -5 \end{aligned}$$

$$\begin{aligned} \textcircled{29} \quad x - 4y &= 10 & x &= -3 \\ 3x - 2y &= 0 \\ -3x + 12y &= -30 \\ \underline{3x - 2y} &= 0 \\ 10y &= -30 \\ y &= -3 \end{aligned}$$



$$\begin{aligned} x - 4(-3) &= 10 \\ x = -2 & \quad \boxed{(-2, -3)} \end{aligned}$$

$$\textcircled{30} \quad y \geq -x + 4 \text{ and } y \leq 3x - 6$$



"C"

Alg. Skills Review Answer Key

- ① Symmetric Property of Equality
- ② Additive Inverse

$$\begin{aligned} \textcircled{3} \quad 3a^3 - (b - 2c)^2 \\ 3(-1)^3 - [(2) - 2(-2)]^2 \\ 3(-1) - [6]^2 \\ -3 - 36 = \boxed{-39} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 2a(b + 2a) &= 3b + 5a \\ 2ab + 4a^2 &= 3b + 5a \\ 2ab - 3b &= 5a - 4a^2 \\ b(2a - 3) &= 5a - 4a^2 \end{aligned}$$

$$\boxed{b = \frac{5a - 4a^2}{2a - 3} \text{ for } 2a - 3 \neq 0}$$

$$\begin{aligned} \textcircled{5} \quad 2 - \frac{3n}{4} &< 4(n + 5) + 1 \\ \left[2 - \frac{3n}{4} < 4n + 20 + 1 \right] (\cdot 4) \end{aligned}$$

$$\begin{aligned} 8 - 3n &< 16n + 84 \\ -19n &< 76 \end{aligned}$$

$$\boxed{n > -4} \quad \text{sign flip}$$

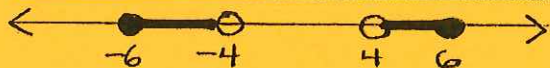
$$\begin{aligned} \textcircled{6} \quad |3n - 6| &> 3 \\ 3n - 6 > 3 \text{ or } 3n - 6 < -3 \\ 3n > 9 \text{ or } 3n < 3 \end{aligned}$$

$$\boxed{n > 3 \text{ or } n < 1}$$



$$\begin{aligned} \textcircled{7} \quad |n| > 4 \text{ and } |n| \leq 6 \\ (n > 4 \text{ or } n < -4) \text{ and } (n \leq 6 \text{ and } n \geq -6) \end{aligned}$$

$$\boxed{(n > 4 \text{ or } n < -4) \text{ and } (-6 \leq n \leq 6)}$$



$$\begin{aligned} \textcircled{8} \quad (-2x^2y^4z^3)^3 (\frac{1}{2}x^{-1}y^{-2}z)^3 \\ (-8x^6y^{12}z^9) (\frac{1}{8}x^{-3}y^{-6}z^3) \end{aligned}$$

$$\boxed{-x^3y^6z^{12}}$$

$$\textcircled{9} \quad \frac{16a^{-2}b^{-3}cd^4}{-12ab^3c^{-2}d^3} = \boxed{\frac{-4c^3d}{3a^3b^6}}$$

$$\textcircled{10} \quad \frac{6n^3x^{3a-b}}{2nx^{a+2b}} = 3n^2x^{(3a-b)-(a+2b)} = \boxed{3n^2x^{2a-3b}}$$

$$(11) (x-4y)(3x-4y)$$

$$\boxed{3x^2 - 16xy + 16y^2}$$

$$(12) (2a^{x+1} - 3b^{x-1})^2$$

$$\boxed{4a^{2x+2} - 12a^{x+1}b^{x-1} + 9b^{2x-2}}$$

$$(13) \begin{array}{r} x+y \overline{) 5x^3 - 5x^2y + 5xy^2 - 5y^3 + \cancel{2y^4} / x+y} \\ \underline{5x^4} \underline{-3y^4} \\ 5x^4 + 5x^3y \\ \underline{-5x^3y} \\ -5x^2y - 5x^2y^2 \\ \underline{5x^2y^2} \\ 5x^2y^2 + 5xy^3 \\ \underline{-5xy^3 - 3y^4} \\ -5xy^3 - 5y^4 \\ \underline{2y^4} \end{array}$$



$$(14) \frac{32.5 \times 10^4}{2.5 \times 10^{-2}} = 13 \times 10^6 = \boxed{1.3 \times 10^7}$$

$$(15) (3x-2y)^2 - (x-5y)^2$$

$$[(3x-2y) + (x-5y)][(3x-2y) - (x-5y)]$$

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

$$(16) 6a^3b + 7a^2b^2 + 2ab^3$$

$$ab(6a^2 + 7ab + 2b^2)$$

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

$$ab[2a(3a+2b) + b(3a+2b)]$$

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

$$(17) x^2a^4 - x^2b^4 + y^2b^4 - y^2a^4$$

$$x^2(a^4 - b^4) + y^2(b^4 - a^4)$$

$$x^2(a^4 - b^4) - y^2(a^4 - b^4)$$

$$(a^4 - b^4)(x^2 - y^2)$$

$$(a^2 + b^2)(a^2 - b^2)(x+y)(x-y)$$

$$\boxed{(a^2 + b^2)(a+b)(a-b)(x+y)(x-y)}$$

$$(18) 4n^3 + n = 4n^2$$

$$4n^3 - 4n^2 + n = 0$$

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

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

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

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

$$\boxed{n = 0, 1/2}$$

$$(19) a^3 = 16a$$

$$a^3 - 16a = 0$$

$$a(a^2 - 16) = 0$$

$$a(a+4)(a-4) = 0$$

$$\boxed{a = 0, -4, 4}$$

$$(20) f(x) = x - 3x^2$$

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

$$(a+2) - 3(a^2 + 4a + 4)$$

$$a+2 - 3a^2 - 12a - 12$$

$$\boxed{-3a^2 - 11a - 10}$$

$$(21) \frac{(-4, 5)}{(-10, 17)} = \frac{5-17}{(-4)-(-10)} = \frac{-12}{6} = -2$$

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

$$2x + y = C$$

$$2(-4) + (5) = -3$$

$$2x + y = -3$$

$$y\text{-int } (C/B) = (0, -3)$$

$$x\text{-int } (C/A) = (-3/2, 0)$$

$$(22) (0, 0) \quad m = -4$$

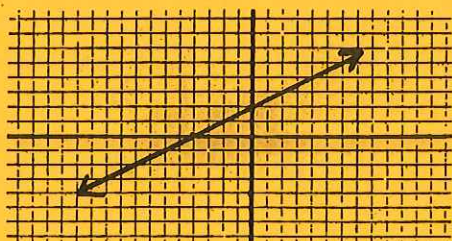
$$y = -4x + b$$

$$(0) = -4(0) + b \quad b = 0$$

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

$$\begin{aligned} (23) \quad & 10y = 20 + 5x \\ & -5x + 10y = 20 \\ & 5x - 10y = -20 \end{aligned}$$

$$\begin{aligned} & x - 2y = -4 \\ & \text{slope } (-A/B) = 1/2 \\ & \text{y-int } (C/B) = (0, 2) \\ & \text{x-int } (C/A) = (-4, 0) \end{aligned}$$



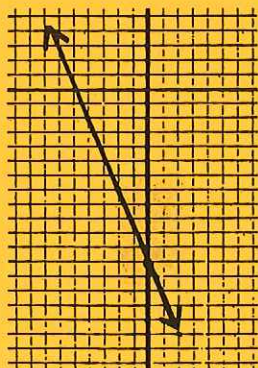
$$(24) \quad \begin{aligned} & (2, 6) \quad \frac{6-4}{2-(-1)} = \frac{2}{3} \\ & (-1, 4) \end{aligned}$$

$$\begin{aligned} & y - 6 = \frac{2}{3}(x - 2) \text{ or} \\ & y - 4 = \frac{2}{3}(x + 1) \end{aligned}$$

$$(25) \quad \begin{aligned} & 2x - 5y = 6 \quad \text{slope } 2/5 \\ & \perp \text{ slope} = -5/2 \end{aligned}$$

$$\begin{aligned} & y = -5/2x + b \\ & (-2) = -5/2(-4) + b \\ & -2 = 10 + b \quad b = -12 \end{aligned}$$

$$y = -5/2x - 12$$



$$(26) \quad \begin{aligned} & (-1, 9)(7, -11) \text{ midpoint} \\ & \frac{-1+7}{2}, \frac{9+(-11)}{2} \quad \boxed{(3, -1)} \end{aligned}$$

$$\begin{aligned} (27) \quad & y = \frac{2}{7}x - 4 \quad m = 2/7 \quad (0, -4) \\ & 2x - 7y = 14 \quad m = 2/7 \quad (0, -2) \end{aligned}$$

parallel lines

independent, inconsistent, 0

$$(28) \quad \begin{aligned} & 2x - y = 5 \quad y = 2x - 5 \\ & x - 4y = -1 \end{aligned}$$

$$\begin{aligned} & x - 4(2x - 5) = -1 \\ & x - 8x + 20 = -1 \\ & -7x = -21 \\ & x = 3 \\ & y = 2(3) - 5 = 1 \end{aligned}$$

$$\boxed{(3, 1)}$$

$$(29) \quad \begin{aligned} & 3x - y = -2 \quad x = -3 \\ & 4x - 3y = 4 \end{aligned}$$

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

$$4x - 3y = 4$$

$$-5x = 10$$

$$x = -2$$

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

$$y = -4$$

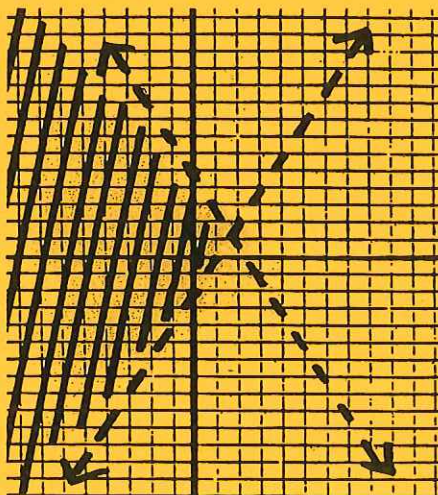
$$\boxed{(-2, -4)}$$

I DIDN'T KNOW THAT



$$(30) \quad \begin{aligned} & 6x + 3y < 15 \quad \text{and} \quad 2x - y < 2 \\ & 3y < -6x + 5 \quad \text{and} \quad -y < -2x + 2 \end{aligned}$$

$$y < -2x + 5 \quad \text{and} \quad y > 2x - 2$$



Problem Solving Review

"A"

Prob. Solving Review Answer Key

① x $\begin{array}{|c|} \hline 11 \\ \hline \end{array}$ \leftarrow
 $x+2$ $\begin{array}{|c|} \hline 13 \\ \hline \end{array}$ \leftarrow

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

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

$$-x = -11$$

$$x = 11$$

② $-11 < 2n+3 < 5$
 Subtract 3
 $-14 < 2n < 2$
 divide by 2
 $-7 < n < 1$
 negative, even
 $n = \boxed{-6, -4, -2}$



③

| | | | |
|------|------------|--------------|-------------|
| | <u>now</u> | <u>4 ago</u> | <u>in 1</u> |
| Paul | $4n$ | $4n-4$ | |
| John | $5n$ | | $5n+1$ |

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

$$8n-8 = 5n+1$$

$$3n = 9 \quad \text{John } 5n = 15$$

$$n = 3 \quad \text{Paul } 4n = 12$$

$$15-12 = \boxed{3 \text{ yrs older}}$$

④ $n + (n+1)^2 = 55$
 $n + (n^2 + 2n + 1) = 55$
 $n^2 + 3n - 54 = 0$
 $(n+9)(n-6) = 0$
 $n = -9, 6$

| | | |
|-------|------|-----|
| n | -9 | 6 |
| $n+1$ | -8 | 7 |



⑤ 2 digit number = tu
 $t+u = 10 \quad u = 10-t$
 $10u+t = 3(10t+u) - 2$
 $10u+t = 30t+3u-2$
 $7u-29t = -2$
 $7(10-t) - 29t = -2$
 $70-7t-29t = -2$
 $-36t = -72$
 $t = 2$
 $u = 10-(2) = 8 \quad \boxed{28}$

⑥ $.07n + 180 = 320$
 $.07n = 140$
 $n = 2000 \quad \boxed{\$2000}$

⑦ dimes n
 quarters $27-n$
 $10n + 25(27-n) = 450$
 $10n + 675 - 25n = 450$
 $-15n = -225$
 $n = 15 \quad \boxed{15 \text{ dimes}}$

⑧ $\frac{\text{after tax}}{\text{org. price}} = \frac{81.90}{n} = \frac{105}{100}$
 $105n = 8190$
 $n = 78 \quad \boxed{\$78.00}$

⑨ $.06n + .08(4000-n) = 270$
 $.06n + 320 - .08n = 270$
 $-.02n = -50$
 $n = 2500 \quad \boxed{\$2500 @ 6\%}$
 $\quad \quad \quad \boxed{\$1500 @ 8\%}$

⑩ $3.50(n) + 1.25(11-n) = 20.50$
 $3.5n + 13.75 - 1.25n = 20.5$
 $2.25n = 6.75$
 $n = 3$
 $11-n = 8$
 $\boxed{3 \text{ adult, } 8 \text{ child}}$

⑪ $.25(800) + 1.0(n) = .4(800+n)$
 $200+n = 320+.4n$
 $.6n = 120$
 $n = 200$ 200 ml of acid

⑫ Alice $\frac{R}{3} \cdot \frac{T}{t} = \frac{D}{3t}$
 Marshall $6 \cdot (t - \frac{1}{6}) = 6t - 1$

$3t = 6t - 1$
 $-3t = -1$ $7:30 + :20$
 $t = \frac{1}{3}$ 7:50 Am
 $t = 20 \text{ min}$

⑬ $\frac{R}{r-c} \cdot \frac{T}{4} = \frac{D}{32}$ Upstream
 $\frac{R}{r+c} \cdot \frac{T}{2} = \frac{D}{32}$ downstream

$4r - 4c = 32 \div 4$ $r - c = 8$
 $2r + 2c = 32 \div 2$ $r + c = 16$

$\frac{2r}{2r} = \frac{24}{2r}$
 $r = 12$
 $c = 4$

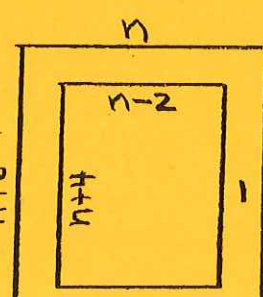
Current 4 mph

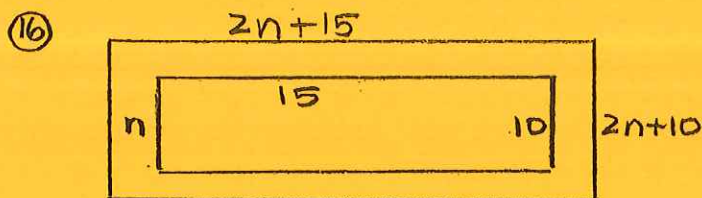
⑭ $3n - 4$
 n

$2n + 2(3n - 4) = 48$
 $2n + 6n - 8 = 48$
 $8n = 56$
 $n = 7$ 7×17
 $3n - 4 = 17$ 119 in²

⑮ $n(n+6) - (n-2)(n+4) = 64$
 $n^2 + 6n - (n^2 + 2n - 8) = 64$
 $4n + 8 = 64$
 $4n = 56$
 $n = 14$
 $n - 2 = 12$
 $n + 4 = 18$

12 by 18 inches





Original garden $(10)(15) = 150$
 new garden (doubled) = 300

$(2n+10)(2n+15) = 300$
 $4n^2 + 50n + 150 = 300$
 $4n^2 + 50n - 150 = 0$
 $2n^2 + 25n - 75 = 0$
 $2n^2 + 30n - 5n - 75 = 0$
 $2n(n+15) - 5(n+15) = 0$
 $(n+15)(2n-5) = 0$
 $n = -15$ or $\frac{5}{2}$

Strip is $\frac{5}{2}$ feet



"B"

Prob. Solving Review Answer Key

① n $\frac{-3}{n+1}$ $\frac{-2}{n+2}$ \leftarrow

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

② $-6 < 4n - 2 < 14$
 $-4 < 4n < 16$ add 2
 $-1 < n < 4$ divide by 4
 positive, odd
 $n = \boxed{1, 3}$

③

| | | | |
|-------|------|--------|--------|
| | now | in 1 | in 4 |
| Lou | $3n$ | $3n+1$ | |
| Vince | $4n$ | | $4n+4$ |

$$3(3n+1) = 2(4n+4)$$

$$9n+3 = 8n+8$$

$$n = 5$$

$$\text{Vince } 4n = 20$$

$$\text{Vince next yr} = \boxed{21 \text{ yrs old}}$$

④

| | | | |
|-------|---|--|---|
| n | = | $\begin{bmatrix} 9 & -7 \\ 7 & -9 \end{bmatrix}$ | ← |
| $n-2$ | = | $\begin{bmatrix} 7 & -9 \\ 9 & -7 \end{bmatrix}$ | |

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

$$n^2 - 2n - 63 = 0$$

$$(n-9)(n+7) = 0$$

$$n = 9, -7$$

⑤ 2 digit number = tu
 $t = u - 3$

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

$$10u + t = 20t + 2u + 2$$

$$8u - 19t = 2$$

$$8u - 19(u-3) = 2$$

$$8u - 19u + 57 = 2$$

$$-11u = -55$$

$$u = 5$$

$$t = (5) - 3 = 2 \quad \boxed{25}$$

⑥ n = number of tickets

$$.11(5n) - 175 = 100$$

$$.55n = 275$$

$$n = 500$$

$$\boxed{500 \text{ tickets}}$$

⑦

| | | | |
|----------|--------|--------------|----------|
| nickels | n | 8 | |
| dimes | $2n-6$ | 10 | |
| quarters | $2n$ | $\boxed{16}$ | quarters |

$$5n + 10(2n-6) + 25(2n) = 540$$

$$5n + 20n - 60 + 50n = 540$$

$$75n = 600$$

$$n = 8$$

⑧

| | |
|----------------|---------------------------------|
| purchase price | $\frac{72}{n} = \frac{90}{100}$ |
| original price | |

$$90n = 7200$$

$$n = 80$$

$$\boxed{\$80}$$

⑨ $.12(8000-n) = 2(.09n) + 60$

$$960 - .12n = .18n + 60$$

$$-.3n = -900$$

$$n = 3000 \quad \boxed{\$3000 @ 9\%}$$

⑩ n pounds of peanuts
 $15-n$ pounds of cashews

$$1.75n + 2.05(15-n) = 1.85(15)$$

$$1.75n + 30.75 - 2.05n = 27.75$$

$$-.3n = -3$$

$$n = 10 \quad 15 - (10) = 5$$

$$\boxed{10 \text{ lbs peanuts, } 5 \text{ lbs cashews}}$$

⑪ $.25(n) + .5(1000-n) = .32(1000)$

$$.25n + 500 - .5n = 320$$

$$-.25n = -180$$

$$n = 720$$

$$1000 - n = 280$$

$$\boxed{720g \text{ of } 25\%}$$

$$\boxed{280g \text{ of } 50\%}$$

⑫

| | | | | | |
|---------|---------------|----------|---------------|-----|---------------------|
| | $\frac{R}{r}$ | \times | $\frac{T}{2}$ | $=$ | $\frac{D}{2r}$ |
| Plane 1 | r | | 2 | $=$ | $2r$ |
| Plane 2 | $(r+50)$ | | $\frac{3}{2}$ | $=$ | $\frac{3r}{2} + 75$ |

$$2r + \frac{3r}{2} + 75 = 1300$$

$$4r + 3r + 150 = 2600$$

$$7r = 2450$$

$$r = 350$$

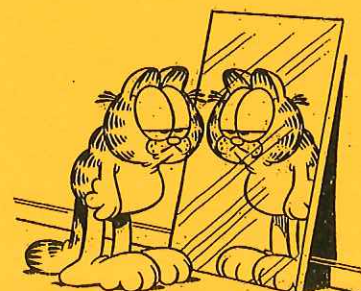
$$r + 50 = 400$$

$$\boxed{\text{Plane 1}}$$

$$\boxed{350 \text{ mph}}$$

$$\boxed{\text{Plane 2}}$$

$$\boxed{400 \text{ mph}}$$



⑬ $\frac{R}{T} = \frac{D}{D}$
 Against wind $(r-w) \cdot 3 = 36$
 with wind $(r+w) \cdot 1\frac{1}{5} = 36$

$$3r - 3w = 36 \quad \div 3 \quad r - w = 12$$

$$\frac{9}{5}r + \frac{9}{5}w = 36 \quad \times \frac{5}{9} \quad r + w = 20$$

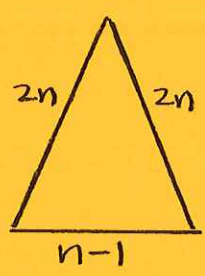
$$2r = 32$$

$$r = 16$$

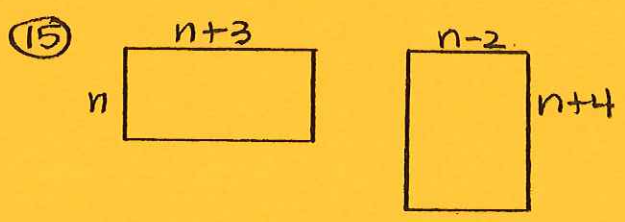
$$w = 4$$

wind 4 mph

⑭ $2n + 2n + (n-1) = 34$
 $5n - 1 = 34$
 $5n = 35$
 $n = 7$
 $n - 1 = 6$



6 cm



$$n(n+3) - (n+4)(n-2) = 16$$

$$(n^2 + 3n) - (n^2 + 2n - 8) = 16$$

$$n + 8 = 16$$

$$n = 8$$

8 by 11 in.

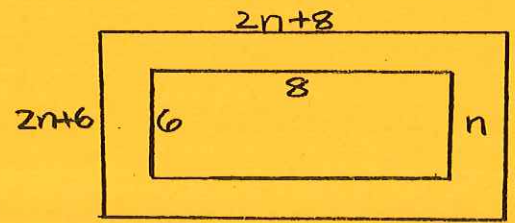
⑯ $(2n+6)(2n+8) - (16)(8) = 72$
 $4n^2 + 28n + 48 - 48 = 72$
 $4n^2 + 28n - 72 = 0$
 $n^2 + 7n - 18 = 0$



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

$$n = -9, 2$$

strip width = 2 feet



"C"

Prob. Solving Review Answer Key

① $n = 7$
 $n+2 = 9$
 $n+4 = 11$

no even solution

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

$$2n+4 - n-4 = 7$$

$$n = 7$$

② $5 < 2n - 3 < 17$
 $8 < 2n < 20$ add 3
 $4 < n < 10$ divide by 2
 odd, prime solutions
 $n = \boxed{5, 7}$

③

| | now | 7 ago |
|-------|--------|-------|
| Aaron | $n+12$ | $n+5$ |
| Cindy | n | $n-7$ |

$$n+5 = 3(n-7)$$

$$n+5 = 3n-21$$

$$-2n = -26$$

$$n = 13$$

Cindy now = 13
 Aaron now = 25
 Aaron 7 ago = 18
 $18 - 13 = \boxed{5 \text{ years}}$

④ $n = -9, 4$
 $n+2 = -7, 6$

no even solution

$$n + (n+2)^2 = 40$$

$$n + (n^2 + 4n + 4) = 40$$

$$n^2 + 5n - 36 = 0$$

$$(n+9)(n-4) = 0$$

$$n = -9, 4$$

consecutive even

⑤ 2 digit number = tu

$t = u + 3$

$(10t + u) + (10u + t) = 121$

$11t + 11u = 121$

$11(u + 3) + 11u = 121$

$11u + 33 + 11u = 121$

$22u = 88$

$u = 4$

$t = (4) + 3 = 7$

$74 - 47 = \boxed{27}$

⑥ $.075n + 3(210) = 1575$

$.075n = 945$

$n = 12,600$

$\boxed{\$12,600}$



⑦ nickels $x + 7$

dimes x

quarters $27 - (2x + 7) = 20 - 2x$

$5(x + 7) + 10(x) + 25(20 - 2x) = 255$

$5x + 35 + 10x + 500 - 50x = 255$

$-35x = -280$

$x = 8$

$x + 7 = 15 \quad \boxed{15 \text{ nickels}}$

⑧ $\frac{\text{after tax}}{\text{org. price}} = \frac{18.90}{n} = \frac{105}{100}$

$105n = 1890$

$n = 18$

$18.90 - 18 = \boxed{\$.90}$

⑨ $.10(n) = 2[.08(14,000 - n)] + 100$

$.1n = 2240 - .16n + 100$

$.26n = 2340$

$n = 9000$

$14,000 - n = 5000$

$\boxed{\$9000 @ 10\%}$
 $\boxed{\$5000 @ 8\%}$

⑩ $2.40(n) + 1.90(10 - n) = 23$

$2.4n + 19 - 1.9n = 23$

$.5n = 4$

$n = 8$

$\boxed{8 \text{ lbs caramels @ } \$2.40}$
 $\boxed{2 \text{ lbs cherries @ } \$1.90}$

⑪ $.30(200) + .80(n) = .60(200 + n)$

$60 + .8n = 120 + .6n$

$.2n = 60$

$n = 300 \quad \boxed{300 \text{ g}}$

⑫ $\frac{R}{\text{martha}} \times \frac{T}{(r+10)} = \frac{D}{4} = 4r + 40$
 $\frac{R}{\text{Noreen}} \times \frac{T}{r} = \frac{D}{3.75} = 3.75r$

$(4r + 40) + (3.75r) = 350$

$7.75r + 40 = 350$

$7.75r = 310$

$r = 40$

$r + 10 = 50 \quad \boxed{50 \text{ mph}}$

⑬ $\frac{R}{\text{Against wind}} \times \frac{T}{(r-w)} = \frac{D}{2} = 800$
 $\frac{R}{\text{with wind}} \times \frac{T}{(r+w)} = \frac{D}{1\frac{1}{4}} = 800$

$2r - 2w = 800 \quad \div 2 \quad r - w = 400$

$\frac{5}{4}r + \frac{5}{4}w = 800 \quad \times \frac{4}{5} \quad r + w = 640$

$2r = 1040$

$r = 520$

$w = 120$

$\boxed{\text{Plane } 520 \text{ mph}}$

⑭ $2(n) + 2(3n - 5) = 38$

$2n + 6n - 10 = 38$

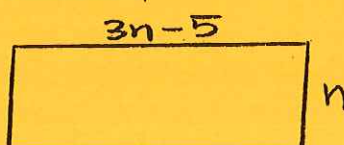
$8n = 48$

$n = 6$

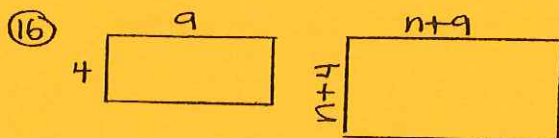
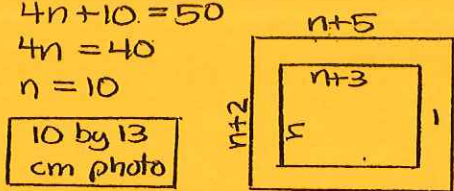
$6 \text{ by } 13 \text{ m}$

$(6)(13)$

$\boxed{78 \text{ m}^2}$



$$\begin{aligned} (15) \quad (n+5)(n+2) - n(n+3) &= 50 \\ (n^2 + 7n + 10) - (n^2 + 3n) &= 50 \\ 4n + 10 &= 50 \\ 4n &= 40 \\ n &= 10 \end{aligned}$$



$$\begin{aligned} (n+4)(n+9) - (4)(9) &= 30 \\ (n^2 + 13n + 36) - 36 &= 30 \\ n^2 + 13n - 30 &= 0 \\ (n+15)(n-2) &= 0 \\ n &= -15, 2 \\ \text{new rectangle } n+4 &= 6 \\ & \quad n+9 = 11 \end{aligned}$$

Perimeter $2(6) + 2(11)$
34 inches

Quarterly Exam #3 - Skills REMEDIATION & EXTRA PRACTICE

① Symmetric Property of Equality

Associative Property of Addition

$$\begin{aligned} (2) \quad x^2y - 2xy^2 \\ (-1)^2(-2) - 2(-1)(-2)(-3) \\ (1)(-2) - 2(-1)(-2)(-3) \\ (-2) - (-12) \\ (-2) + (+12) &= \boxed{10} \end{aligned}$$

$$\begin{aligned} 3x^3y^2 + xy^3 \\ 3(-1)^3(-2)^2 + (-1)(-2)^3 \\ 3(-1)(+4) + (-1)(-8) \\ (-12) + (+8) &= \boxed{-4} \end{aligned}$$

$$(3) \quad 4 + \frac{2(n+7)}{3} > 3n+11$$

$$3 \left[4 + \frac{2n+14}{3} > 3n+11 \right]$$

$$\begin{aligned} 12 + 2n+14 &> 9n+33 \\ 2n+26 &> 9n+33 \\ -7n &> 7 \quad \boxed{n < -1} \end{aligned}$$

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

$$2 \left[\frac{3n}{2} - 4 \leq 3n+6+n \right]$$

$$\begin{aligned} 3n-8 &\leq 8n+12 \\ -5n &\leq 20 \quad \boxed{n \geq -4} \end{aligned}$$

$$(4) \quad |2x-1| - 3 \leq 6$$

$$|2x-1| \leq 9$$

$$2x-1 \leq 9 \text{ and } 2x-1 \geq -9$$

$$2x \leq 10 \text{ and } 2x \geq -8$$

$$x \leq 5 \text{ and } x \geq -4$$

$$\boxed{-4 \leq x \leq 5}$$



$$|x-5| + 4 > 7$$

$$|x-5| > 3$$

$$x-5 > 3 \text{ or } x-5 < -3$$

$$\boxed{x > 8 \text{ or } x < 2}$$



$$(5) \quad \left(-\frac{1}{2}a^2b^{-1}c^3\right)^2 \left(-2a^{-1}b^2c^{-2}\right)^3$$

$$\left(\frac{1}{4}a^4b^{-2}c^6\right) \left(-8a^{-3}b^6c^{-6}\right) = \boxed{-2ab^4}$$

$$\left(-4a^{-3}b^{-2}c^2\right)^2 \left(\frac{1}{2}a^3b^2c^{-1}\right)^3$$

$$\left(16a^{-6}b^{-4}c^4\right) \left(\frac{1}{8}a^9b^6c^{-3}\right) = \boxed{2a^3b^2c}$$

$$(6) \quad \frac{-15x^{-3}y^2z^{-2}}{10x^2y^{-1}z^{-4}} = \frac{-3y^3z^2}{2x^5}$$

$$\frac{-8xy^{-2}z^2}{-6x^{-4}y^{-1}z^{-3}} = \frac{4x^5z^5}{3y}$$

$$(7) \quad (2a-3b)(a-4b)$$

$$\boxed{2a^2 - 11ab + 12b^2}$$

$$(3a-b)(5a-2b)$$

$$\boxed{15a^2 - 11ab + 2b^2}$$



$$\textcircled{8} \quad x+y \quad \begin{array}{r} 3x^2 - 3xy + 3y^2 - \frac{4y^3}{x+y} \\ \hline 3x^3 \qquad \qquad \qquad -y^3 \\ 3x^3 + 3x^2y \\ \hline -3x^2y \\ -3x^2y - 3xy^2 \\ \hline 3xy^2 - y^3 \\ 3xy^2 + 3y^3 \\ \hline -4y^3 \end{array}$$

$$2x-y \quad \begin{array}{r} 8x^2 + 4xy + 2y^2 + \frac{4y^3}{2x-y} \\ \hline 16x^3 \qquad \qquad \qquad +2y^3 \\ 16x^3 - 8x^2y \\ \hline 8x^2y \\ 8x^2y - 4xy^2 \\ \hline 4xy^2 + 2y^3 \\ 4xy^2 - 2y^3 \\ \hline 4y^3 \end{array}$$

$$\textcircled{9} \quad \frac{38 \times 10^4}{.4 \times 10^{-1}} = 95 \times 10^5$$

$$\boxed{9.5 \times 10^6}$$

$$\frac{.225 \times 10^{-5}}{1.5 \times 10^{-2}} = .15 \times 10^{-3}$$

$$\boxed{1.5 \times 10^{-4}}$$

$$\textcircled{10} \quad 18a^3 - 2ab^2$$

$$2a(9a^2 - b^2) = \boxed{2a(3a+b)(3a-b)}$$

$$12a^4 - 27a^2b^2$$

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

$$\textcircled{11} \quad 6x^2 - 19xy + 10y^2$$

$$6x^2 - 15xy - 4xy + 10y^2$$

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

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

60
^
-15 -4

$$4x^2 - 10xy - 6y^2$$

$$2(2x^2 - 5xy - 3y^2)$$

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

$$2[2x(x-3y) + y(x-3y)]$$

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

-6
^
-6 1

$$\textcircled{12} \quad 2n^3 - 6n = -n^2$$

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

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

$$n(2n^2 + 4n - 3n - 6) = 0$$

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

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

$$\boxed{n = 0, -2, \frac{3}{2}}$$

-12
^
4 -3

$$5n^2 + 3n = -2n^3$$

$$2n^3 + 5n^2 + 3n = 0$$

$$n(2n^2 + 5n + 3) = 0$$

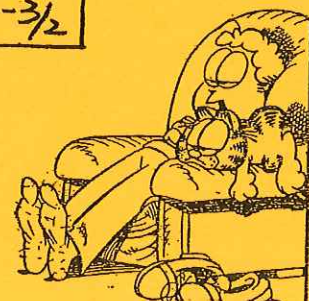
$$n(2n^2 + 2n + 3n + 3) = 0$$

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

$$n(n+1)(2n+3) = 0$$

$$\boxed{n = 0, -1, -\frac{3}{2}}$$

6
^
3 2



$$\textcircled{13} \begin{pmatrix} -3, 5 \\ 2, 4 \end{pmatrix} \frac{5-4}{(-3)-2} = \frac{1}{-5} = \frac{-A}{B} \quad A=1 \quad B=5$$

$$\begin{aligned} Ax + By &= C \\ x + 5y &= C \\ (-3) + 5(5) &= 22 \end{aligned}$$

$$\begin{aligned} x + 5y &= 22 \\ y\text{-int } (0, 22/5) \\ x\text{-int } (22, 0) \end{aligned}$$

$$\begin{pmatrix} 2, -6 \\ -6, -8 \end{pmatrix} \frac{(-6)-(-8)}{2-(-6)} = \frac{2}{8} = \frac{1}{4} = \frac{A}{-B} \quad \frac{A}{B} = \frac{1}{-4}$$

$$\begin{aligned} Ax + By &= C \\ x - 4y &= C \\ (2) - 4(-6) &= 26 \end{aligned}$$

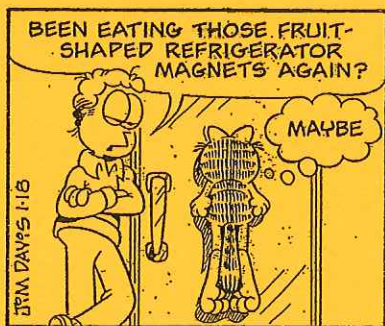
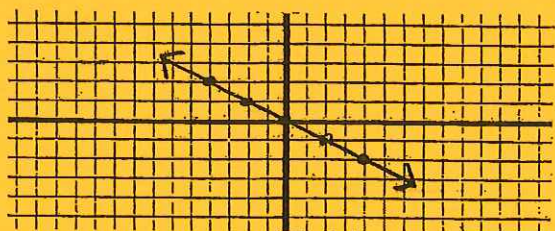
$$\begin{aligned} x - 4y &= 26 \\ y\text{-int } (0, -\frac{B}{A}) \\ x\text{-int } (26, 0) \end{aligned}$$

$$\textcircled{14} \text{ slope of } 2x - y = 6 \text{ is } 2 \quad (-4, 2)$$

$$\perp m = -\frac{1}{2}$$

$$\begin{aligned} y &= -\frac{1}{2}x + b \\ (2) &= -\frac{1}{2}(-4) + b \\ b &= 0 \end{aligned}$$

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

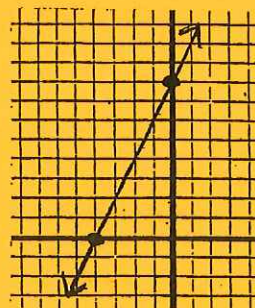


$$\text{slope of } x + 2y = 9 \text{ is } -\frac{1}{2} \quad (-2, 4)$$

$$\perp m = 2$$

$$\begin{aligned} y &= 2x + b \\ (4) &= 2(-2) + b \\ b &= 8 \end{aligned}$$

$$y = 2x + 8$$



$$\textcircled{15} \begin{aligned} 2x + 3y &= 6 \quad m = \frac{2}{3} \quad (0, 2) \\ y &= \frac{2}{3}x + 2 \quad m = \frac{2}{3} \quad (0, 2) \end{aligned}$$

dependent, consistent, inf

$$\begin{aligned} x + 4y &= 12 \quad m = -\frac{1}{4} \\ y &= \frac{1}{4}x + 3 \quad m = \frac{1}{4} \end{aligned}$$

independent, consistent, 1

$$\textcircled{16} \begin{aligned} 2x + 5y &= 1 \quad x(-3) \\ 3x - 2y &= -8 \quad x(2) \end{aligned}$$

$$\begin{aligned} -6x - 15y &= -3 \\ 6x - 4y &= -16 \end{aligned}$$

$$(-3, 1)$$

$$-19y = -19$$

$$y = 1 \quad x = -2$$

$$\begin{aligned} 3x - 4y &= 0 \quad x(3) \\ 5x - 3y &= -11 \quad x(-4) \end{aligned}$$

$$\begin{aligned} 9x - 12y &= 0 \\ -20x + 12y &= 44 \end{aligned}$$

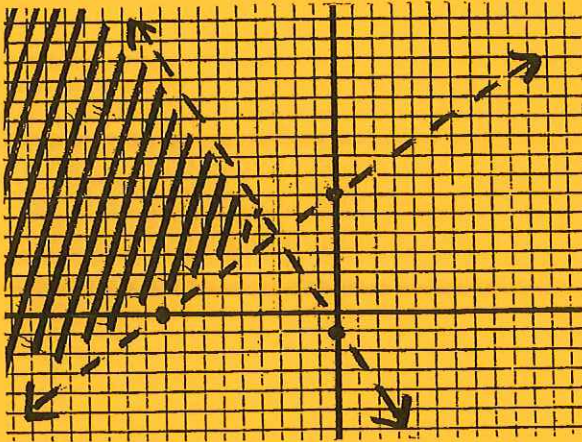
$$(-4, 3)$$

$$-11x = 44$$

$$x = -4 \quad y = 3$$

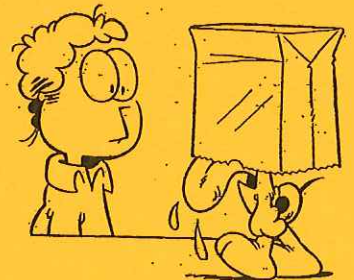
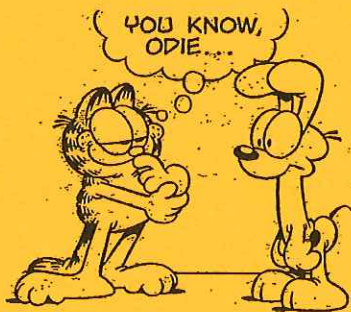
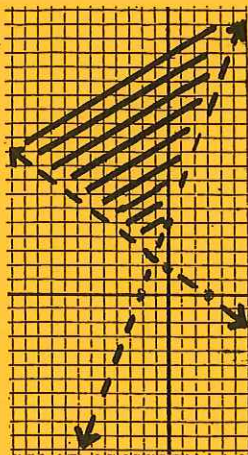
$$\textcircled{17} \quad y > \frac{2}{3}x + 6$$

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



$$y > \frac{5}{2}x + 5$$

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



$$\textcircled{19} \quad (a^{2x-1} - 3b^{3x})^2$$

$$a^{4x-2} - 6a^{2x-1}b^{3x} + 9b^{6x}$$

$$(3a^{x+3} - 4b^{5x})^2$$

$$9a^{2x+6} - 24a^{x+3}b^{5x} + 16b^{10x}$$

$$\textcircled{20} \quad 9a^2x^4 - 9a^2y^4 + b^2y^4 - b^2x^4$$

$$9a^2(x^4 - y^4) + b^2(y^4 - x^4)$$

$$9a^2(x^4 - y^4) - b^2(x^4 - y^4)$$

$$(x^4 - y^4)(9a^2 - b^2)$$

$$(x^2 + y^2)(x^2 - y^2)(3a + b)(3a - b)$$

$$(x^2 + y^2)(x + y)(x - y)(3a + b)(3a - b)$$

$$\textcircled{18} \quad f(x) = -3 - 2x - x^2$$

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

$$= -3 - 2n + 6 - (n^2 - 6n + 9)$$

$$= -3 - 2n + 6 - n^2 + 6n - 9 = \boxed{-n^2 + 4n - 6}$$

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

$$f(2n+1) = -(2n+1)^2 + 4(2n+1)$$

$$= -(4n^2 + 4n + 1) + 8n + 4$$

$$= -4n^2 - 4n - 1 + 8n + 4 = \boxed{-4n^2 + 4n + 3}$$

$$a^4x^4 - 16b^4x^4 + 16b^4y^4 - a^4y^4$$

$$x^4(a^4 - 16b^4) + y^4(16b^4 - a^4)$$

$$x^4(a^4 - 16b^4) - y^4(a^4 - 16b^4)$$

$$(a^4 - 16b^4)(x^4 - y^4)$$

$$(a^2 + 4b^2)(a^2 - 4b^2)(x^2 + y^2)(x^2 - y^2)$$

$$(a^2 + 4b^2)(a + 2b)(a - 2b)$$

$$(x^2 + y^2)(x + y)(x - y)$$

Quarterly Exam #3 - Problem Solving

REMEDICATION & EXTRA PRACTICE - Key

$$\begin{aligned} \textcircled{1} \rightarrow & \boxed{-7}n & (n+1)-9 &= 2n-1 \\ & -6n+1 & n-8 &= 2n-1 \\ & -5n+2 & -n &= 7 \\ & & n &= -7 \end{aligned}$$

$$\begin{aligned} & -11n & (n+4)+3-(2n-5) &= 3(n+2)+50 \\ \rightarrow & \boxed{-9}n+2 & n+7-2n+5 &= 3n+6+50 \\ & -7n+4 & -n+12 &= 3n+56 \\ & & -4n &= 44 \\ & & n &= -11 \end{aligned}$$

| | | | |
|-------|------------|--------------|--------------|
| | <u>now</u> | <u>3 ago</u> | <u>in 12</u> |
| Ralph | $4n$ | $4n-3$ | $4n+12$ |
| Alice | $5n$ | $5n-3$ | $5n+12$ |

$$\begin{aligned} 4(5n-3) &= 3(4n+12) \\ 20n-12 &= 12n+36 \\ 8n &= 48 \\ n &= 6 \end{aligned}$$

$5n-1 = \boxed{29 \text{ yrs old}}$

| | | | |
|----------|------------|-------------|--------------|
| | <u>now</u> | <u>in 2</u> | <u>2 ago</u> |
| Betty | $2n$ | $2n+2$ | $2n-2$ |
| Veronica | $3n$ | $3n+2$ | $3n-2$ |

$$\begin{aligned} 5(2n+2) &= 4(3n-2) \\ 10n+10 &= 12n-8 \\ -2n &= -18 \\ n &= 9 \end{aligned}$$

$2n+1 = \boxed{19 \text{ yrs old}}$



$$\begin{aligned} \textcircled{3} -15 \cdot \boxed{10}n & & n+(n+2)^2 &= 154 \\ -13 \cdot \boxed{12}n+2 & & n+(n^2+4n+4) &= 154 \\ & & n^2+5n+4 &= 154 \\ & & n^2+5n-150 &= 0 \\ & & (n+15)(n-10) &= 0 \\ & & -15 & \quad 10 \end{aligned}$$

$$\begin{aligned} \boxed{-10} \cdot \boxed{5}n & & 3n+(n+1)^2 &= 51 \\ \boxed{-9} \cdot \boxed{6}n+1 & & 3n+(n^2+2n+1) &= 51 \\ & & n^2+5n+1 &= 51 \\ & & n^2+5n-50 &= 0 \\ & & (n+10)(n-5) &= 0 \\ & & -10 & \quad 5 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad t+u &= 12 \quad (x-8 \text{ elimination}) \\ 10u+t &= 2(10t+u)-12 \\ 10u+t &= 20t+2u-12 \\ -19t+8u &= -12 \\ -8t-8u &= -96 \\ \hline -27t &= -108 \\ t &= 4 \\ u &= 8 \end{aligned}$$

$\boxed{48}$

$$\begin{aligned} t &= u-1 \quad (\text{substitution}) \\ 2(10u+t) &= 10t+u+74 \\ 20u+2t &= 10t+u+74 \\ 19u-8t &= 74 \\ 19u-8(u-1) &= 74 \\ 19u-8u+8 &= 74 \\ 11u &= 66 \\ u &= 6 \\ t &= 5 \end{aligned}$$

$\boxed{56}$

⑤ 5 nickels x
 9 dimes $2x-1$
 10 quarters $2x$

$$5x + 10(2x-1) + 25(2x) = 365$$

$$5x + 20x - 10 + 50x = 365$$

$$75x = 375$$

$$x = 5$$

9 dimes

⑦ $.6(50) + .2(n) = .3(50+n)$
 $30 + .2n = 15 + .3n$
 $-.1n = -15$
 $n = 150$ **150 kg**

$.4(25) + (n) = .5(25+n)$
 $10 + n = 12.5 + .5n$
 $.5n = 2.5$
 $n = 5$ **5 ounces**

4 nickels x
 7 dimes $3x-5$
 12 quarters $3x$

$$5x + 10(3x-5) + 25(3x) = 390$$

$$5x + 30x - 50 + 75x = 390$$

$$110x = 440$$

$$x = 4$$

23 coins

⑧ $\frac{R}{T} = \frac{D}{T}$

Jarod $r+20 \cdot 3.5 \quad 3.5r+70$
 Sydney $r \cdot 2.5 \quad 2.5r$

$600 - 290 = 310$ ←
 distance they have driven by 4:30

$(3.5r+70) + (2.5r) = 310$
 $6r + 70 = 310$
 $6r = 240$
 $r = 40$ **40 mph**

⑥ 10% $8160-n$
 8% n

$$.1(8160-n) = 3(.08n)$$

$$816 - .1n = .24n$$

$$-.34n = -816$$

$$n = 2400$$

\$2400

$\frac{R}{T} = \frac{D}{T}$

Steve $r+10 \cdot 4 \quad 4r+40$
 Eydie $r \cdot 3.5 \quad 3.5r$

$(4r+40) + (3.5r) = 325$
 $7.5r = 285$
 $r = 38$
 $r+10 = 48$ **48 mph**

9% n
 6% $11,000-n$

$$.06(11,000-n) = .09n + 210$$

$$660 - .06n = .09n + 210$$

$$-.15n = -450$$

$$n = 3000$$

\$3000



9

$$\frac{R}{T} = \frac{D}{T}$$

downstream $r+c$ 6 96

upstream $r-c$ 3 24

$$6r + 6c = 96 \rightarrow 6r + 6c = 96$$

$$3r - 3c = 24 \rightarrow 6r - 6c = 48$$

$$12r = 144$$

4mph

$$r = 12$$

$$c = 4$$

$$\frac{R}{T} = \frac{D}{T}$$

with wind $r+w$ 5 50

against $r-w$ 10 60

$$5r + 5w = 50 \rightarrow 5r + 5w = 50$$

$$10r - 10w = 60 \rightarrow 5r - 5w = 30$$

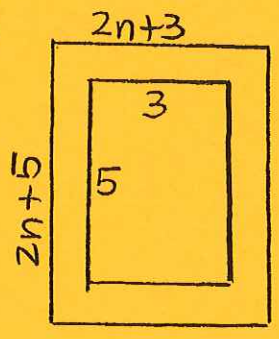
$$10r = 80$$

2mph

$$r = 8$$

$$w = 2$$

10



$$(2n+5)(2n+3) - (5)(3) = 9$$

$$4n^2 + 16n + 15 - 15 = 9$$

$$4n^2 + 16n - 9 = 0$$

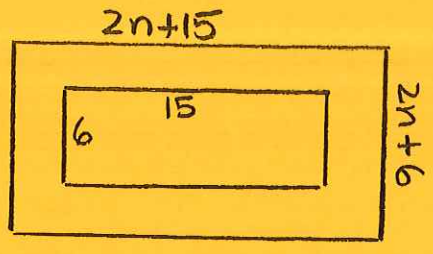
$$4n^2 + 18n - 2n - 9 = 0$$

$$2n(2n+9) - 1(2n+9) = 0$$

$$(2n+9)(2n-1) = 0$$

$$-4\frac{1}{2} \quad \frac{1}{2}$$

$\frac{1}{2}$ inch



$$(2n+15)(2n+6) - (6)(15) = 100$$

$$4n^2 + 42n + 90 - 90 = 100$$

$$4n^2 + 42n - 100 = 0$$

$$2n^2 + 21n - 50 = 0$$

$$2n^2 - 4n + 25n - 50 = 0$$

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

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

$$2 \quad -\frac{25}{2}$$

2 feet

