

$$9-9 \rightarrow 9-15 \quad 9 \cdot 6 \cdot 1$$

$$9-9) \quad a) \quad x^4 - 6x^3 - 6x^2 + 6x - 7 \quad (x \pm 1)(x \pm 7)$$

$$b) \quad \begin{array}{l} x=1 \\ x=-1 \end{array} \quad \begin{array}{l} 1 - 6 - 6 + 6 - 7 \neq 0 \\ 1 + 6 - 6 - 6 - 7 \neq 0 \end{array} \quad \begin{array}{l} \text{Neither} \\ \text{are factors} \end{array}$$

$$9-10) \quad ax^2 + 5x + 6 = 0 \quad \text{discriminant} \quad \sqrt{b^2 - 4ac} > 0$$

$$\sqrt{25 - 4a \cdot 6} \geq 0$$

$$25 - 24a \geq 0$$

$$25 \geq 24a$$

$$25 \geq a$$

$$24 \geq a$$

$$\boxed{a \leq \frac{25}{24}}$$

$$9-11) \quad a) \quad \sin \theta = .5 \quad 30^\circ \text{ or } 150^\circ$$

$$b) \quad \cos \theta = -.5 \quad 120^\circ \text{ or } 240^\circ$$

$$c) \quad \begin{array}{l} 4 \tan \theta - 4 = 0 \\ 4 \tan \theta = 4 \\ \tan \theta = 1 \end{array} \quad 45^\circ \text{ or } 225^\circ$$

$$d) \quad \begin{array}{l} 3 \sin^2 \theta = 1 \\ \sqrt{\sin^2 \theta} = \sqrt{1/3} \end{array}$$

$$\sin \theta = .5773$$

$$\sin^{-1} .5773 = 35.26 / 144.74 / 215.26 / 324.76^\circ$$

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

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

$$3x = 5y - 2$$

$$\frac{3x+2}{5} = \frac{5y}{5} \Rightarrow$$

$$\boxed{y = \frac{3x+2}{5}} \quad \checkmark$$

9-13) a) $10^{0.5 \cdot 5 \cdot 5} = 10^1 = 10$

b) $10^{0.8} = 6.3$

c) $10^{6.2} = 158493.192 \div 2 = 792446.6$
 $10^x = 792446.6$

$x \log 10 = \log 792446.6$

$x = 5.9$

9-14) a) $x = -2 + \sqrt{3}$ $x = -2 - \sqrt{3}$

$(x+2)^2 = (\sqrt{3})^2$

$x^2 + 4x + 4 = 3$

$x^2 + 4x + 1 = 0$

$(x + (-2 + \sqrt{3}))$ and

$(x - (-2 + \sqrt{3}))$

b) $x = 2 + i$ $x = -2 - i$

$(x - (2 + i))$

and

$(x + (2 + i))$

$(x-2)^2 = i^2$

$x^2 - 4x + 4 = -1$

$x^2 - 4x + 5$

9-15) ① $2P + 3B + 4R = 52$
 ② $1P + 5B = 13$
 ③ $3B - 4R = -34$

① $2P + 3B + 4R = 52$
 ③ $3B - 4R = -34$

$2P + 6B = 18$

$2P + 6B = 18$
 $-2(P + 5B) = 13$

$2P + 6B = 18$
 $-2P - 10B = -26$

$-4B = -8$

$B = 2$

$P + 5(2) = 13$

$P = 13 - 10$

$P = 3$

$3(2) - 4R = -34$

$-4R = -40$

$R = 10$

Boards = \$2

Posts = \$3

Piers = \$10

$$\underline{9-25} \rightarrow 9-29 \quad 90102$$

$$9-25) \quad y = 2x^2 + 8x + 5$$

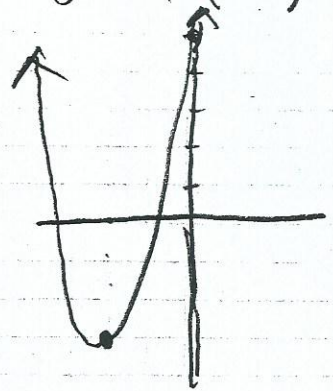
$$y = 2(x^2 + 4x) + 5$$

$$2(x^2 + 4x + 4) + 5 - 8$$

$$2(x+2)^2 - 3$$

$$y\text{-int} = 5$$

vertex $(-2, -3)$



$$9-26) \quad \left[\frac{z+y}{2} + \frac{z-y}{4} = 3 \right] \cdot 4 = 2z + 2y + z - y = 12$$

$$3z + y = 12$$

$$\left[\frac{4z-y}{2} + \frac{5z+2y}{11} = 3 \right] \cdot 22$$

$$44z - 11y + 10z + 4y = 66$$

$$54z - 7y = 66$$

$$7(3z + y = 12)$$

$$21z + 7y = 84$$

$$75z = 150$$

$$\boxed{z = 2}$$

$$3(z) + y = 12$$

$$\boxed{y = 6}$$

$$9-27) \quad a) \log_2(x) + \log_2(x-2) = 3$$

$$\log_2(x^2 - 2x) = 3$$

$$2^3 = x^2 - 2x$$

$$8 = x^2 - 2x$$

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

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

$$\boxed{x = 4} \quad x \neq 2$$

$$b) \log(2x) - \log(x^2) = -2$$

$$\log \frac{2x}{x^2} = -2$$

$$10^{-2} = \frac{2x}{x^2}$$

$$.01 = \frac{2x}{x^2}$$

$$.01x^2 = 2x$$

$$\frac{.01x}{.01} = \frac{2}{.01}$$

$$\boxed{x = 200}$$

$$9-28) \quad a) 30^\circ = \pi/6 \quad b) 15^\circ = \pi/12$$

$$c) -75^\circ = 285 \quad \frac{285}{360} = \frac{x}{2\pi}$$

$$x = \frac{570\pi}{360} = \frac{57\pi}{36} = \frac{19\pi}{12}$$

$$d) \frac{630^\circ}{360} = \frac{x}{2\pi}$$

$$x = \frac{7\pi}{2}$$

$$9-29) \quad \begin{matrix} x = -2 \\ x = 2 \end{matrix} \text{ \& double root}$$

$$y = a(x+2)^2(x-2) \quad (0, 2)$$

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

$$2 = a(-8)$$

$$-1/4 = a$$

$$y = -1/4(x+2)^2(x-2)$$

7-140, 111, 112

9-40, 42, 43, 44 (9.1.3)

9-40) $3B + 2R = 5B + R$ $2(2R + B = 40)$
 $R - 2B = 0$

Blue - 8 grams $R - 2B = 0$ $16 - 2B = 0$
 $4R + 2B = 80$ $16 = 2B$
 Red - 16 grams $5R = 80$ $B = 8$
 $R = 16$

9-42) $\frac{3x+6}{x^2+7x+10} = \frac{3(x+2)}{(x+5)(x+2)}$ $\frac{3}{x+5}$

9-43) $\frac{x-4}{x+2} + \frac{4x+12}{(x+3)(x+2)}$

$\frac{(x+3)}{x+3} \cdot \frac{(x-4)}{x+2} + \frac{4x+12}{(x+3)(x+2)} = \frac{x^2+3x-4x-12+4x+12}{(x+3)(x+2)}$

$\frac{x^2+3x}{(x+3)(x+2)} = \frac{x(x+3)}{(x+3)(x+2)}$ $\frac{x}{x+2}$

9-44) a) $\frac{144}{360} = \frac{x}{2\pi}$ $x = \frac{4\pi}{5}$

b) $\frac{300}{360} = \frac{x}{2\pi}$ $x = \frac{15\pi}{9}$

$\frac{5(180)}{9} \rightarrow$ c) $\frac{5\pi/9}{2\pi} = \frac{x}{360}$ $x = 100^\circ$

$\frac{17(180)}{12} \rightarrow$ d) $\frac{17\pi/12}{2\pi} = \frac{x}{360}$ $x = 255^\circ$

$\frac{19(180)}{2} \rightarrow$ e) $\frac{19\pi/2}{2\pi} = \frac{x}{360}$ $x = 1710$

f) $\frac{220}{360} = \frac{x}{2\pi}$ $x = \frac{11\pi}{9}$