

R.1 (23)  $(4, -2) (-2, -5)$   $d = \sqrt{(-2-4)^2 + (-5+2)^2} = \sqrt{6^2 + 3^2} = \sqrt{45} = 3\sqrt{5}$

(39)  $(4, -2) (-2, -5)$  MP =  $(\frac{4-2}{2}, \frac{-2-5}{2}) = (1, -\frac{7}{2})$

R.2 (53)  $y^2 = x+4$

y-INT  
 $y^2 = 0+4 \Rightarrow y = \pm 2$   
 $(0, -2) + (0, 2)$

x-INT  
 $0^2 = x+4 \Rightarrow x = -4$   
 $(-4, 0)$

SYMMETRY TESTS

x-axis?  $(-y)^2 = x+4$   
 $y^2 = x+4$  YES  
 y-axis?  $y^2 = -x+4$  NO  
 origin?  $(-y)^2 = -x+4$   
 $y^2 = -x+4$  NO

(61)  $y = x^3 + x^2 - 9x - 9$

$y = x^2(x+1) - 9(x+1)$   
 $= (x^2-9)(x+1)$   
 $= (x+3)(x-3)(x+1)$

x-INT  
 $(-3, 0)$   
 $(3, 0)$   
 $(-1, 0)$

y-INT  
 $y = 0^3 + 0^2 - 9(0) - 9$   
 $y = -9$   
 $(0, -9)$

FAILS ALL 3 SYMMETRY TESTS

R.3 (49)  $(1, 3) (-1, 2)$

$m = \frac{2-3}{-1-1} = \frac{1}{2}$

(63) Parallel to  $x=3$   
 Through  $(4, 2)$

(67)  $\perp 2x+y=2 \Rightarrow y = -2x+2$   
 Through  $(-3, 0)$   
 $m_1 = -2$   
 $m_2 = +\frac{1}{2}$

$y-2 = \frac{1}{2}(x+1)$  Point-Slope  
 $y = \frac{1}{2}x + \frac{5}{2}$  Slope-Intercept

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

$x=3$  is Vertical,  
 therefore a parallel line is also vertical  
 $x=4$

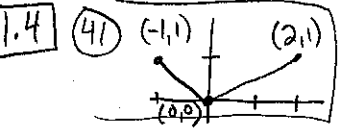
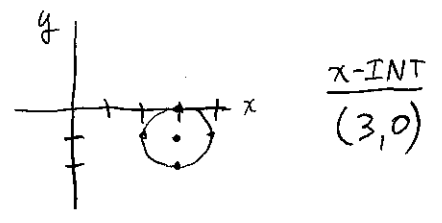
$y-0 = \frac{1}{2}(x+3)$   
 $y = \frac{1}{2}x + \frac{3}{2}$  OR  $x-2y = -3$

R.4 (15)  $r=5$   
 $(h, k) = (4, -3)$

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

$(x-4)^2 + (y+3)^2 = 25$  Standard Form  
 $x^2 - 8x + 16 + y^2 + 6y + 9 = 25$   
 $x^2 + y^2 - 8x + 6y = 0$  General Form

$x^2 - 6x + y^2 + 2y = -9$   
 $x^2 - 6x + 9 + y^2 + 2y + 1 = -9 + 9 + 1$   
 $(x-3)^2 + (y+1)^2 = 1$   
 Center:  $(3, -1)$   $r=1$



1st Piece:  $m = \frac{1-0}{-1-0} = -1$   $2^{nd}$  Piece:  $m = \frac{1-0}{2-0} = \frac{1}{2}$   
 $y = -x$   $y = \frac{1}{2}x$

$f(x) = \begin{cases} -x & -1 \leq x \leq 0 \\ \frac{1}{2}x & 0 < x \leq 2 \end{cases}$

1.5  $19-26$   $y = x^3$

- (19) RIGHT 4  $y = (x-4)^3$
- (20) LEFT 4  $y = (x+4)^3$
- (21) UP 4  $y = x^3 + 4$
- (22) DOWN 4  $y = x^3 - 4$
- (23) y-axis REFL.  $y = (-x)^3$
- (24) x-axis REFL.  $y = -x^3$

(31)  $(3, 6)$  is on  $y=f(x)$   
 Name Point on  $y=-f(x)$   
 $(3, -6)$

(34)  $(4, 2)$  is on  $y=f(x)$   
 Name Point on  $y=f(2x)$   
 $(2, 2)$

(25) VERT STRETCH 4  
 $y = 4x^3$

(26) HORIZ STRETCH 4  
 $y = (\frac{1}{4}x)^3$

1.7 (42) R varies directly with L and inversely with  $D^2$  (Resistance, Length, Diameter of a wire)

$R = \frac{k \cdot L}{D^2} \Rightarrow 1.24 = \frac{k \cdot 432}{4^2} \Rightarrow \frac{(1.24) 4^2}{432} = k \Rightarrow k \approx .0459$

$R = \frac{.0459 L}{D^2} \Rightarrow 1.44 = \frac{.0459 L}{3^2} \Rightarrow L = \frac{(1.44) 3^2}{.0459} \approx 282.19 \text{ Feet}$

1.R (Pg 116-119)

$$(15) f(x) = \frac{x}{x^2+2x-3} = \frac{x}{(x+3)(x-1)}$$

DOMAIN:  $x \neq -3, 1$  OR  $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

$$(30) g(x) = \frac{4+x^2}{1+x^4}$$

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

Conclusion:  $g(x)$  is EVEN

(76)  $p$  varies directly with  $B$   
(payment + amount Borrowed)

$$p = k B \Rightarrow 854 = k(130,000) \Rightarrow \frac{854}{130,000} = k \approx .00657$$

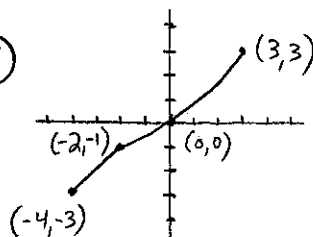
$$p = .00657 B \Rightarrow p = .00657(165,000) = \boxed{\$1083.92}$$

(78)  $W$  varies inversely with the square of  $d$  (Weight + distance)

$$W = \frac{k}{d^2} \Rightarrow 200 = \frac{k}{3960^2} \Rightarrow 200(3960)^2 = k = 3,136,320,000$$

$$W = \frac{3,136,320,000}{d^2} \Rightarrow W = \frac{3,136,320,000}{3961^2} \approx \boxed{199.899 \text{ lbs}}$$

(25)



a) D:  $[-4, 3]$  R:  $[-3, 3]$

b)  $(0, 0)$  is only intercept

c)  $f(-2) = -1$

d)  $f(x) = -3$  when  $x = 4$

e)  $f(x) > 0$  when  $0 < x \leq 3$

f)  $y = f(x-3)$  Shift RIGHT 3

g)  $y = f(\frac{1}{2}x)$  Horizontal stretch of 2

h)  $y = -f(x)$  Reflect about  $x$ -axis.

(45)  $f(x) = 3x - 4x^2$ , Find Average Rate of Change from 2 to 3

$$f(2) = 3(2) - 4(2)^2 = 6 - 16 = -10$$

$$f(3) = 3(3) - 4(3)^2 = 9 - 36 = -27$$

$$\begin{array}{c|c} x & f(x) \\ \hline 2 & -10 \\ 3 & -27 \end{array} \left. \vphantom{\begin{array}{c|c} x & f(x) \\ \hline 2 & -10 \\ 3 & -27 \end{array}} \right\} \text{Ave Rt Chng} = \frac{-27 + 10}{3 - 2} = \boxed{-17}$$