Monday 11/17 2.2.3 (2-125 → 2-131)

2-125) a) $y = \frac{2}{3}x + 1$ Not even or odd

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

$f(x) \neq f(-x)$

$f(-x) \neq -f(x)$

b) $y = (x+2)^2$

$\neq$ Not even

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

see math notes pg 219

$y = -(x+2)^2 \neq y = (x+2)^2$ Not odd

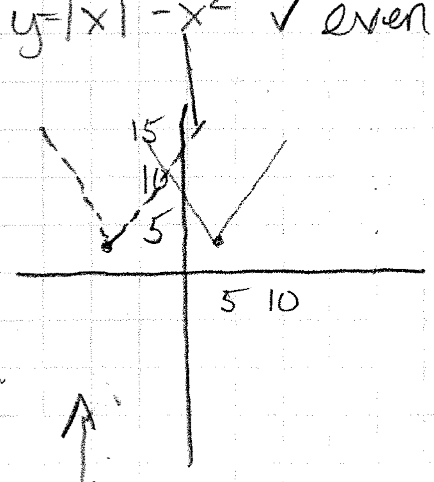
c) $y = |x| - x^2$

$y = |-x| - (-x)^2 = y = |x| - x^2$ ✓ even

$y = |-x| - x^2$

2-126) a) $f(x) = 2|x-4| + 3$

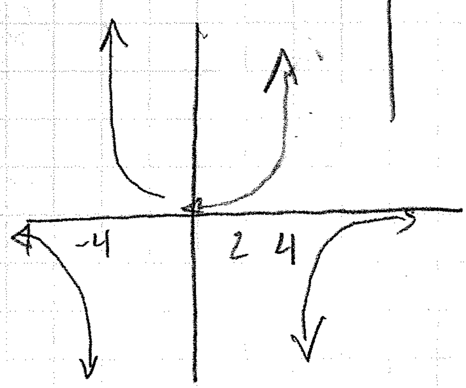
$f(-x) = 2|-x-4| + 3$



see Math Notes pg 219

b) $f(x) = \frac{1}{x+4}$

$f(-x) = \frac{1}{-x+4}$



Neither function is odd or Even

2-127) v (2,3) pt (0,0)

$y = a(x-h)^2 + k$

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

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

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

$a = -3/4$

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

$0 = 4a + 3$

$-3 \quad -3$

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

2-129) a) $y = 7 + 2x^2 + 4x - 5$

$y = 2x^2 + 4x + 2$

$y = 2(x^2 + 2x + 1)$

$y = 2(x+1)(x+1)$

$\boxed{y = 2(x+1)^2}$

$(h, k) = (-1, 0)$

x-int $(x+1) = 0$

$x = -1$

$(-1, 0)$

y-int $= 2(1) = 2$

$(0, 2)$

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

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

$x^2 = -2x + 2x^2 + y$

$+2x \quad +2x$

$x^2 + 2x = 2x^2 + y$

$-2x^2 \quad -2x^2$

$-x^2 + 2x = y$

$y = -x^2 + 2x$

$y = -1(x^2 - 2x)$

$y \quad -1(x^2 - 2x + 1) \quad +1$

$y = -1(x-1)(x-1) + 1$

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

4

This is pos. because a is negative

$V = (h, k) = (1, 1)$

x int. $0 = -x^2 + 2y$

$x(-x + 2)$

$(0, 0)$

$(2, 0)$

$x = 0$

$x = 2$

y-int: $y = -1(-1)^2 + 1$

$y = -1(1) + 1$

$y = 0$

$(0, 0)$

2-129) a) $3y - 4x = -1$

$9y + 2x = 4$

$\boxed{\text{linear} \quad y = x}$

b) $2(9y + 2x) = 4 \quad = \quad 18y + 4\cancel{x} = 8$

$3y - \cancel{4x} = -1$

$21y = 7$

$y = 7/21 = 1/3$

$3\left(\frac{1}{3}\right) - 4x = -1$

$1 - 4x = -1$

$-1 \quad\quad -1$

$\frac{-4x}{-4} = \frac{-2}{-4}$

$x = 1/2$

$\left(\frac{1}{2}, \frac{1}{3}\right)$

c) $\left(\frac{1}{2}, \frac{1}{3}\right)$

d) The solution to the system is the pt @ which the lines intersect

2-130) a) 10, 2.5, .625   divide by

$t(n) = 10\left(\frac{1}{4}\right)^{n-1}$

b) $-2, -8, -14$ sub 6

$t(n) = -6n + 4$

2-131) a) $y = |x-4| - 2$ $(h,k) = (4,-2)$; vertex

$0 = |x-4| - 2$

$2 = |x-4|$

$2 = x-4$ $-2 = x-4$

$6 = x$ $2 = x$

x int $(6,0)$; $(2,0)$

y int: $y = |-4| - 2$

$y = 4 - 2 = 2$

$(0, 2)$

D: all real #'s

R: $y \geq -2$

b) $y = -|x+1| + 3$ (h,k) $(-1,3)$ vertex

$0 = -|x+1| + 3$

$\frac{-3}{-1} = \frac{-|x+1|}{-1}$

$3 = |x+1|$

$3 = x+1$ $-3 = x+1$

$-1 \quad -1$ $-1 \quad -1$

$2 = x$ $-4 = x$

x int $(-4,0)$; $(2,0)$

y int: $y = -|0+1| + 3$

$y = -1 + 3 = 2$

$(0, 2)$

D: all real #s

R: $y \leq 3$

Alg 2 Hwk 2-139 → 2-145

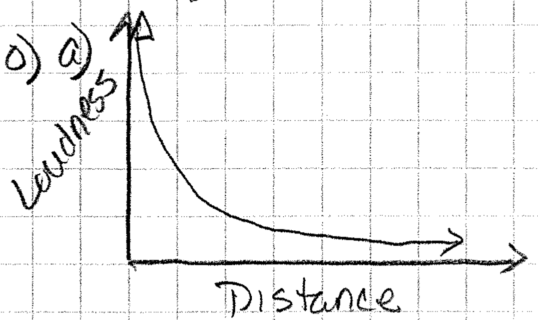
2-139) $y = x^2 + 7x - 8$

$y = \left(x^2 + 7x + \frac{49}{4}\right) - 8 - \frac{49}{4}$

$y = \left(x + \frac{7}{2}\right)^2 - \frac{32}{4} - \frac{49}{4}$

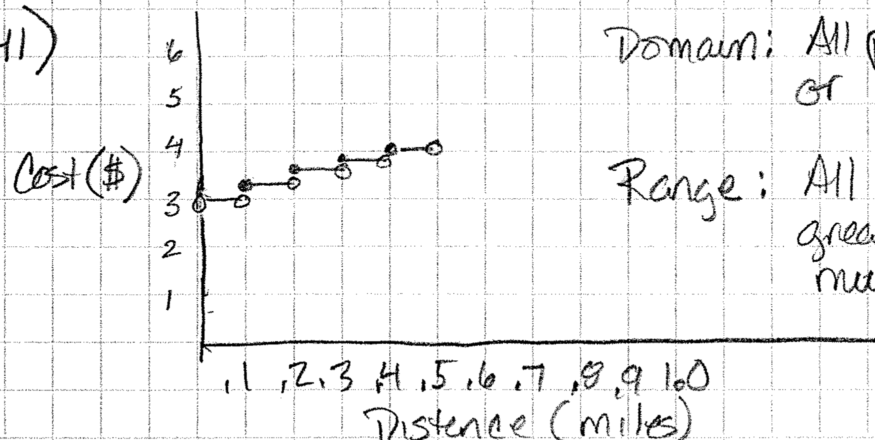
$\boxed{y = \left(x + \frac{7}{2}\right)^2 - \frac{81}{4}}$

2-140) a)



b) dependent = Loudness
independent = Distance

2-141)



Domain: All positive numbers or $D > 0$

Range: All real numbers greater than 3 and multiples of 0.25

2-142)

Odd function when $f(-x) = -f(x)$

Ex: x^5

$f(-x) = (-x)^5 = -x^5 = -f(x)$

also rotates 180° about the origin

2-143)

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

$y = 4\left(\frac{1}{x+5}\right) + 7$

The second is shifted 5 units to the left and 7 units up. It is also stretched by a factor of 4

2-144) a) $(x-1)(x+1) = x^2 + 1x - 1x - 1$

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

b) $2x(x+1)(x+1) = 2x\,(x^2 + x + x + 1)$

$= 2x(x^2 + 2x + 1) = \boxed{2x^3 + 4x^2 + 2x}$

c) $(x-1)(x+1)(x-2) = (x^2 - x + x - 1)(x-2)$

$(x^2-1)(x-2) = \boxed{x^3 - 2x^2 - x + 2}$

d) $y = x^3 - 2x^2 - x + 2$

y-int $= 2$ $\quad (0, 2)$

x-int $\quad (x-1) = 0 \quad x + 1 = 0 \quad x - 2 = 0$

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

$(1, 0) \quad (-1, 0) \quad (2, 0)$

2-145) a) $2 = ab^0 \Rightarrow 2 = a$

$\frac{1}{2} = ab^2$

$\frac{\frac{1}{2}}{2} = \frac{2b^2}{2}$

$\sqrt{\frac{1}{4}} = \sqrt{b^2}$

$\pm\frac{1}{2} = b$

$\boxed{\begin{array}{l} a = 2 \\ b = \pm 1/2 \end{array}}$

b) $\frac{1}{2} = ab^0 \Rightarrow \frac{1}{2} = a$

$2 = ab^2$

$(2)\,2 = \frac{1}{2} b^2\,(2)$

$\sqrt{4} = \sqrt{b^2}$

$\pm 2 = b$

$\boxed{\begin{array}{l} a = \frac{1}{2} \\ b = \pm 2 \end{array}}$

Alg 2 HW 2-146 → 2-152

2-146) a) v(3,5) Pt (0,0)

$y = a(x-h)^2+k$

$y = a(x-3)^2+5$

$0 = a(0-3)^2+5$

$0 = 9a+5$

$\frac{-5}{9} = \frac{9a}{9}$

$-5/9 = a$

$\boxed{y = \frac{-5}{9}(x-3)^2+5}$

b) $y = a(x-5)^2+3$

switch h&k $0 = a(0-5)^2+3$

$0 = 25a+3$

$\frac{-3}{25} = \frac{25a}{25}$

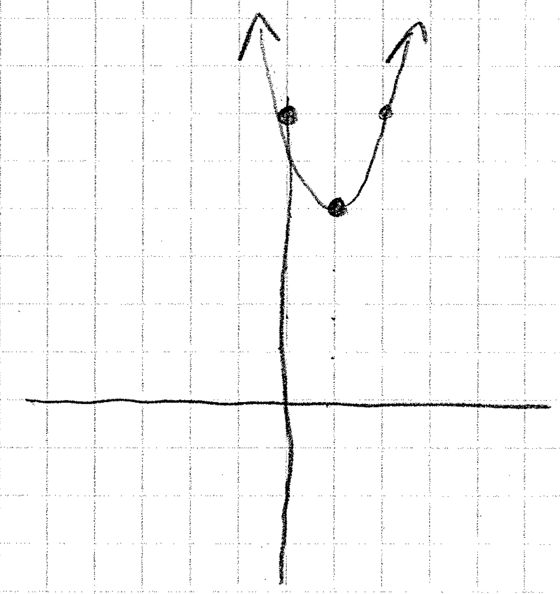
$-3/25 = a$

$\boxed{y = \frac{-3}{25}(x-5)^2+3}$

2-147) $y = 2(x-1)^2+4$

v(1,4)

y-int = 2+4=6



a) $y = 2(x-1)(x-1)+4$

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

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

$\boxed{y = 2x^2-4x+6}$

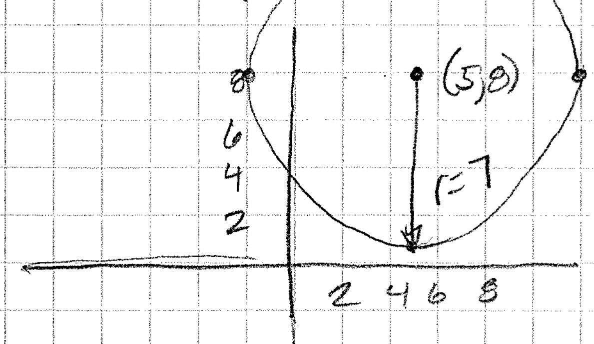
c) parent: $y=x^2$ Parabola

d) parent: same thing $y=x^2$

2-148) $(x-5)^2+(y-8)^2=49$

a) The graph is a circle with center at $(5,8)$ and radius $= 7$ $(\sqrt{49}=7)$

b)



2-149) $(0,2)$ $(1,0)$ a) $m=\frac{2-0}{0-1}=\frac{2}{-1}=-2$

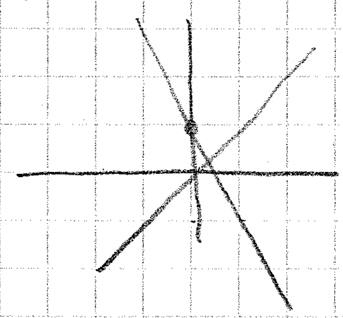
b) $m=-2$ same slope if parallel

c) $m=\frac{1}{2}$ opposite reciprocal if perpendicular

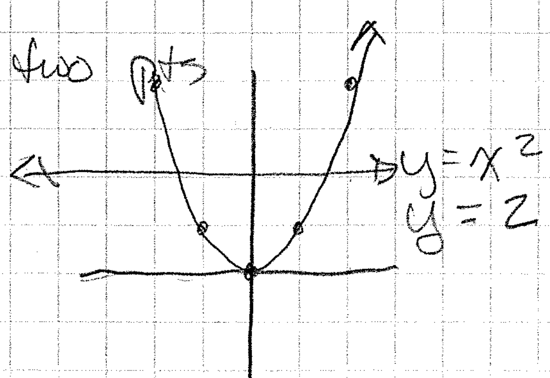
d) $-2\left(\frac{1}{2}\right)=-1$

e) The product of the slopes of two perpendicular lines is -1

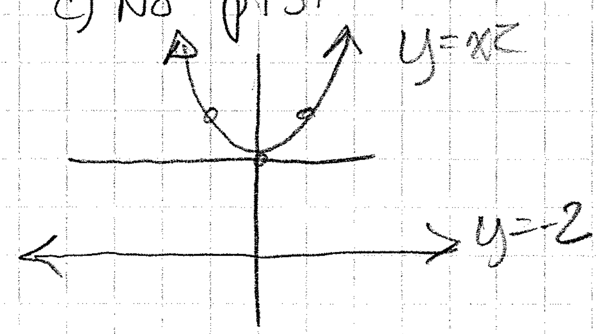
2-150) a) one pt $y=x$ and $y=-2x+1$



b) two pts



c) No pts



2-151) a) $y=(x+12)^2-144$

$y\text{-int} = (12)^2-144=0$ (0,0) y-int

x-int $0=(x+12)^2-144$

$\sqrt{144}=\sqrt{(x+12)^2}$

$\pm 12 = x+12$

$x = 12-12=0$

$x=-12-12=24$

(0,0) and (24,0) x-int

b) $y=(x-8)^2-4$ y-int (0,60)

$y=(0-8)^2-4$

$y=(64)-4=60$

x-int $0=(x-8)^2-4$

$\sqrt{4}=\sqrt{(x-8)^2}$

$\pm 4 = x-8$

$x=12$

$x=8$

(12,0) x-int.
(8,0)

2-152) $5x-4y=7$
$2y+6x=22$

$5x-4y=7$
$2(6x+2y=22)$

$5x-4y=7$
$12x+4y=44$

$17x=51$

$\frac{17x}{17}=\frac{51}{17}$

$x=3$

$2y+6(3)=22$

$2y+18=22$

$2y=4$

$y=2$

$\boxed{(3,2)}$

use elimination

Tues/Wed 2.2.5 (2-162 → 2-169)

2-162) when $x < 2$ $y = -(x-2)^2$

when $x \geq 2$ $y = x + 4$

2-163) even $f(x) = x^2$ $f(x) = f(-x)$

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

$f(-x) = x^2$

The graphs of both will coincide as well as it's x/y table and equation. All are the same

2-164) $y = a|x-h| + k$ $h = -3$ $k = 4$ pt $(-1, 0)$

$y = a|x+3| + 4$

$0 = a|-1+3| + 4$ $a = -2$

$0 = a|2| + 4$

$0 = 2a + 4$ $\boxed{y = -2|x+3| + 4}$

$-4 \quad -4$

$\frac{-4}{2} = \frac{2a}{2}$

2-165) a) $(x-h)^2 + (y-k)^2 = r^2$

$r = 2$

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

$k = 3$

b) $r = 9$ $h = 12$ $k = -15$

$(x-12)^2 + (y+15)^2 = 81$

2-166) $y = x^2 - 5x + 7$ $\left(-5/2\right)^2 = \frac{25}{4}$

$y = \left(x^2 - 5x + \frac{25}{4}\right) + 7 - \frac{25}{4}$ V: $\left(\frac{5}{2}, \frac{3}{4}\right)$

$y = \left(x - \frac{5}{2}\right)\left(x - \frac{5}{2}\right) + \frac{28}{4} - \frac{25}{4}$

$y = (x - 5/2)^2 + 3/4$

2-167) $y = 2x^2 + 3x + 1$; incorrect ; did not use the factoring out the 2 correctly

$y = 2\left(x^2 + \frac{3}{2}x + \frac{1}{2}\right)$ $\left(\frac{3}{4}\right)^2 = \frac{9}{16}$

$y = 2\left(x + \frac{3}{2}x + \frac{9}{16}\right) + \frac{1}{2} - 2\left(\frac{9}{16}\right)$

$y = 2\left(x + \frac{3}{2}\right)^2 + \frac{1}{2} - \frac{18}{16}$

$y = 2(x + 3/2)^2 + \frac{8}{16} - \frac{18}{16}$

$y = 2(x + 3/2)^2 - 10/16$

$y = 2(x + 3/2)^2 - 5/8$

2-168)

x	10	2	3	5
y	101	5	10	26

$f(x) = x^2 + 1$

x	y
2	5
3.	10.
5.	26
10	101

$2^2 + 1 = 5$

$3^2 + 1 = 10$

$5^2 + 1 = 25$

2-169) $x^2 + kx + 18$

$(x + 9)(x + 2)$ $k = 11$

$(x - 9)(x - 2)$ $k = -11$

$(x + 18)(x + 1)$ $k = 19$

$(x - 18)(x - 1)$ $k = -19$

$(x + 6)(x + 3)$ $k = 9$

$(x - 6)(x - 3)$ $k = -9$