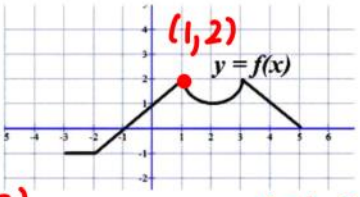
Monday, October 09, 2017
5:59 PM

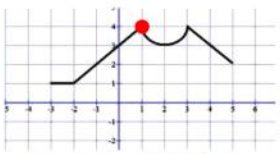
Precalculus
1.7 Practice (Groupwork)

Name: KEY
Period: _____ **Date:** _____

1. The graph of $y = f(x)$ is given in Figure 5.8. The graph of each function in parts (a) – (d) resulted from translations of $y = f(x)$. Give a formula for each of these functions in terms of $f(x)$.

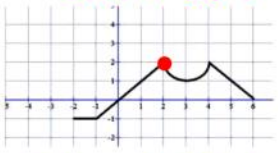


a) (1,4) Shift up 2



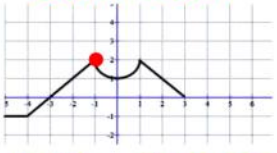
$g(x) = f(x) + 2$

b) (2,2) Shift Rt 1



$g(x) = f(x-1)$

c) (-1,2) Shift 2 left



$g(x) = f(x+2)$

d) (2,1) Shift 1 Rt, 1 down

$g(x) = f(x-1) - 1$

2. Let $y = f(x)$ be given by the graph below. For each of the following functions, choose the letter (a) – (i) corresponding to the graph.

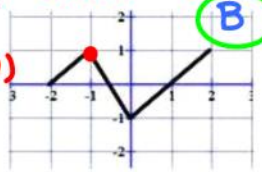
(i) $y = f(2x)$ Horiz Shrink
(-1,1) → (-½,1)
E

(ii) $y = \frac{1}{2} f(x)$ Vertical Shrink
(-1,1) → (-1,½)
C

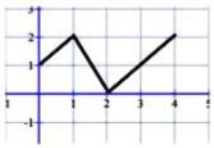
(iii) $y = -f(x) + 1$ Reflect over x-axis, 1 up
(-1,1) → (-1,0)
B

(iv) $y = f(x+2) + 1$ Shift 2 left, 1 up
(-1,1) → (-3,2)
G

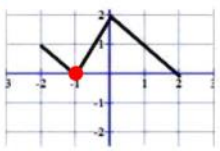
(v) $y = f(-x)$ Reflect over y-axis
(-1,1) → (1,1)
D



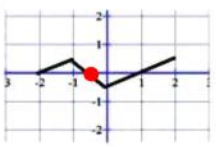
a)



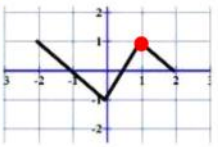
~~b)~~



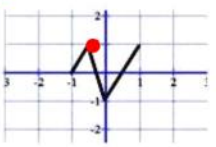
~~c)~~



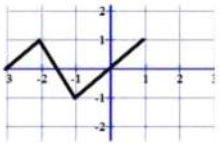
~~d)~~



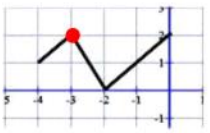
~~e)~~



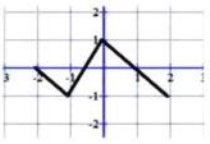
f)



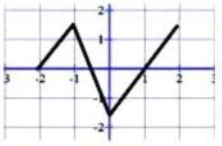
~~g)~~



h)



i)



(3,2) → (4,-2)

3. Figure below shows a function $y = f(x)$. Match each formula with a graph from (a) – (f).

y = -f(x) - 1

(i) $y = f(-x)$ (ii) $y = -f(x)$ (iii) $y = f(-x) + 2$ (iv) $y = -f(x-1)$ (v) $y = -f(-x)$ (vi) $y = -1 - f(x)$

(i) Reflect y-Axis (3,2) → (-3,2) C

(ii) Reflect x-Axis (3,2) → (3,-2) D

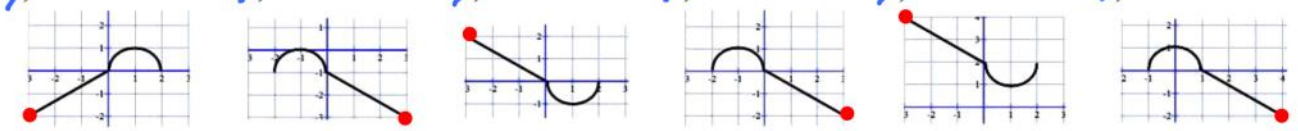
(iii) Reflect y-Axis, up 2 (3,2) → (-3,4) E

(iv) F Shift 1 Rt Reflect x-Axis (3,2)

(v) Reflect over y + x Axis (3,2) → (-3,-2) A

(vi) Reflect over x-Axis Shift down 1 (3,2) → (3,-3) B

a) b) c) d) e) f)



4. Identify the parent function and describe the sequence of transformations. Sketch the graph for each of the transformed functions. NO CALCULATOR.

a). $f(x) = (2x)^2 + 1$ ① ②

$y = x^2$

x	y
-2	4
-1	1
0	0
1	1
2	4

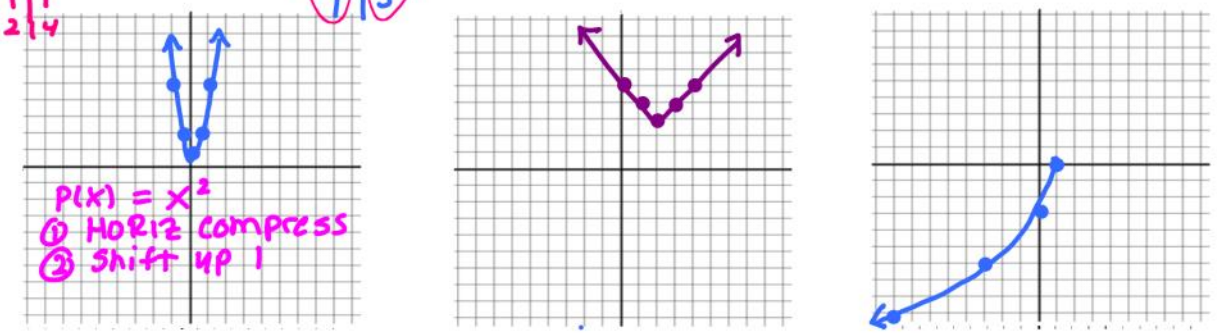
x	½(x)	y+1
-1	-½	5
-½	0	2
0	½	1
½	1	2
1		5

P(x) = x^2
① Horiz compress
② Shift up 1

b). $f(x) = |2 - x| + 3$

c). $f(x) = -3\sqrt{1-x}$

* See work on next pg *

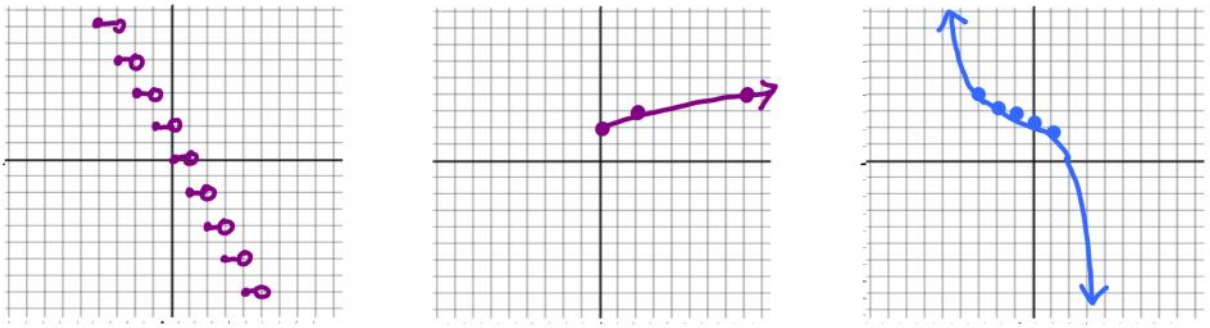


d). $f(x) = -2[\![x]\!]$

e). $f(x) = 2 + \sqrt{\frac{1}{2}x}$

f). $f(x) = 3 - \frac{1}{8}(x+1)^3$

* See work on next pg *



b). $f(x)=|2-x|+3$ = $|-x+2|+3$ = $|-(x-2)|+3$ (① ② ③)

P(x) = |x|

x	y
-2	2
-1	1
0	0
1	1
2	2

① (-1)(x)	② x+2	③ y+3
2	4	5
1	3	4
0	2	3
-1	1	4
-2	0	5
	x	y

① Reflect over y-Axis
② Shift 2 right
③ Shift 3 up

c). $f(x)=-3\sqrt{1-x}$ = $-3\sqrt{-x+1}$ = $-3\sqrt{-(x-1)}$ (③ ① ②)

P(x) = $\sqrt{x}$

x	y
0	0
1	1
4	2
9	3

① (-1)(x)	② x+1	③ (-3)y
0	1	0
-1	0	-3
-4	-3	-6
-9	-8	-9
	x	y

① Reflect over y-Axis
② Shift 1 Rt.
③ Reflect over x-Axis and vertical stretch by 3

d). $f(x)=-2[\![x]\!]$ (①)

P(x) = ||x||

x	y	-2(y)
-1	-1	2
-½	-1	2
0	0	0
½	0	0
1	1	-2
x		y

① Reflect over the x-Axis, vertical stretch by 2

e). $f(x)=2+\sqrt{\frac{1}{2}x}$ $= \sqrt{\frac{1}{2}x} + 2$

① ②

$P(x) = \sqrt{x}$

x	y
0	0
1	1
4	2
9	3

2(x)	y+2
0	2
2	3
8	4
18	5
x	y

① Horizontal stretch by 2
② Shift up 2

f). $f(x)=3-\frac{1}{8}(x+1)^3$ $= -\frac{1}{8}(x+1)^3 + 3$

② ① ③

$P(x) = x^3$

x	y
-2	-8
-1	-1
0	0
1	1
2	8

x-1	(-1/8)y	y+3
-3	1	4
-2	1/8	3 1/8
-1	0	3
0	-1/8	2 7/8
1	-1	2
x		y

① Shift 1 left
② Reflect over x-axis
vertical shrink by 1/8
③ Shift 3 up.