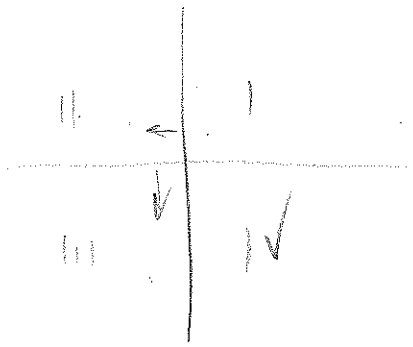
Precalculus Chapter 1 Practice Name: KEY

SHOW ALL WORK!! ☺

Points will be awarded as indicated on each question.

1) What Quadrant is (x,y) located in if $x<0$ & $y<0$?
   a) I
   b) II
   c) III
   d) IV
   e) it is on one of the axes



For #2,3: If $f(x)=x^3+7$

2) What type of symmetry does $f(x)$ have?
   a) x-axis
   b) y-axis
   c) origin
   d) none of the above

$f(-x) = (-x)^3+7$
$= -x^3+7$

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

3) The function $f(x)$ is
   a) odd
   b) even
   c) neither
   d) both

$(-x+1)(-x+1)$

For #4,5: If $f(x)=(x+1)^2$ $= x^2+2x+1$

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

4) What type of symmetry does $f(x)$ have?
   a) x-axis
   b) y-axis
   c) origin
   d) none of the above

5) The function $f(x)$ is
   a) odd
   b) even
   c) neither
   d) both

PreCalculus CP 1 - Chapter 1 Test

For #6,7: If $f(\overset{x}{-2})=\overset{y}{10}$ and $f(\overset{x}{-7})=\overset{y}{-4}$, then

6) What is the linear function that contains the two values?

$m = \frac{10-(-4)}{(-2)-(-7)} = \frac{14}{5}$

$y = \frac{14}{5}x + b$

$10 = \frac{14}{5}(-2) + b$

$b = \frac{78}{5}$

$y = \frac{14}{5}x + \frac{78}{5}$

7) What is the distance between the two points?

$d = \sqrt{(-2-(-7))^2 + (10-(-4))^2}$

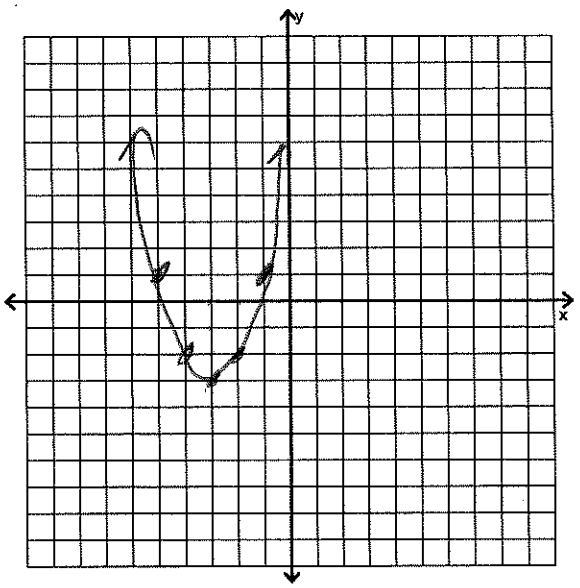
$= \sqrt{25 + 196}$

$= \sqrt{221}$

13 17
17 1

8) Draw a sketch of $g(x)=(x+3)^2-3$.

Be sure to indicate at least three critical points.



(-2, -2)
(-3, -3)
(-4, -2)

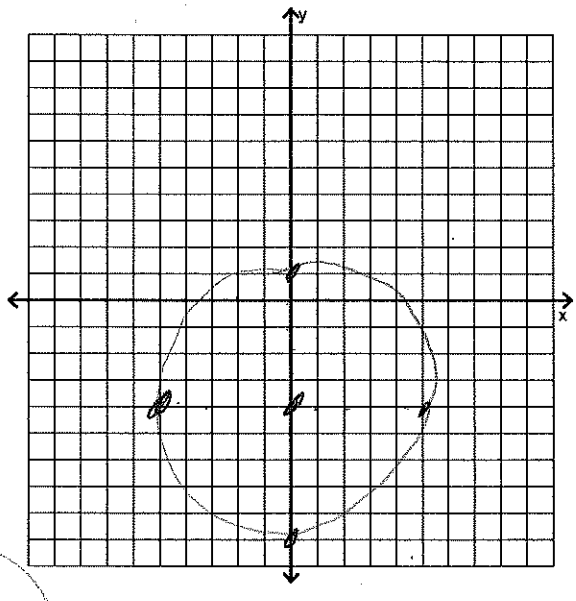
9) A circle passes through the point $(0,4)$ and has a center at $(-6,3)$. What is the equation for the circle?

$(x+6)^2+(y-3)^2=37$

$r=\sqrt{(0+6)^2+(4-3)^2}=\sqrt{37}$

Use the following relation: $x^2+(y+4)^2=25$

10) Graph the relation ------→



11) What are the x-intercepts?

$x^2+4^2=25$
$x^2=9$
$x=\pm 3$

$(3,0)$
$(-3,0)$

12) What are the y-intercepts?

$(y+4)^2=25$
$y+4=\pm 5$
$y=1,-9$

$(0,1)$
$(0,-9)$

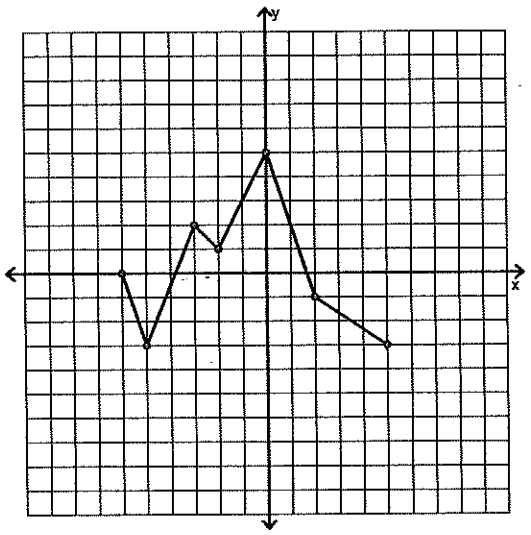
13) What are the domain and range of this relation? (You may use set or interval notation)

D: $[-5,5]$

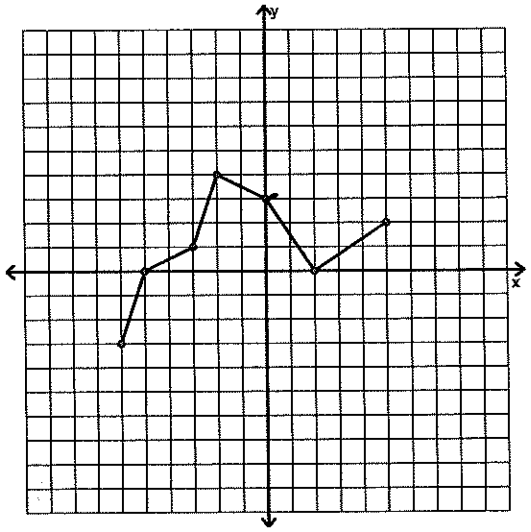
R: $[-9,1]$

For questions 14 – 17, use the graph of $f(x)$ and $g(x)$ below.

$f(x)$



$g(x)$



14) Calculate: $g(g(2))$

$g(2) = 0$

$g(0) = 3$

15) Calculate: $(f+g)(-3)$

$f(-3) + g(-3)$

$2 + 1 = 3$

16) Calculate: $(g \circ f)(-3)$

$f(-3) = 2$

$g(2) = 0$

17) Calculate: $(g/f)(-2)$

$\frac{4}{1} = 4$

18) In general, how does the graph of $f(x)$ relate to the graph of $f(-x)$?

a) Reflect over the x-axis
b) Reflect over the y-axis
c) Reflect over the identity line
d) Reflect over the $y = 1$ line
e) none of the above

For #19,20: If $g(x)=\frac{1}{4}(x+3)^2-4$

19) Find the zero(s) of $g(x)$

$0 = \frac{1}{4}(x+3)^2 - 4$

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

$16 = (x+3)^2$

$4 = x+3$ or $x+3 = -4$

$1 = x$ $\quad x = -7$

$(1,0)$, $(-7,0)$

20) Describe the transformations in comparison to the parent function $f(x)=x^2$
Be specific!

vertical compression by factor of $\frac{1}{4}$

Left 3

down 4

21) Use the technique of completing the square to transform this circle equation into standard form. Then identify the center and radius:

$x^2+y^2+6y+9=8x$

$(x^2-8x+16)-16+(y^2+6y+9)-9+9=0$

$(x-4)^2+(y+3)^2=16$

Standard form: $(x-4)^2+(y+3)^2=16$

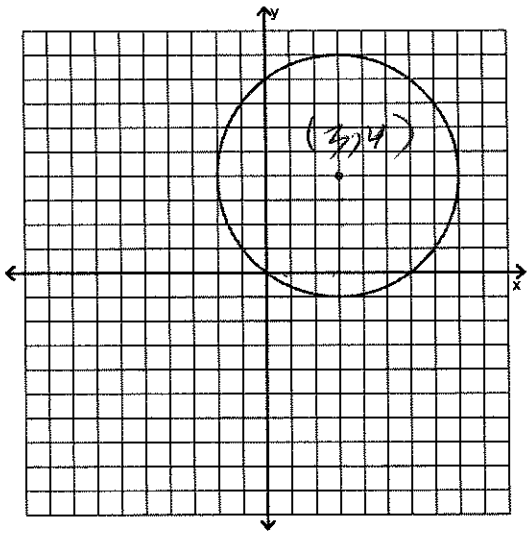
Center: $(4,-3)$ Radius: 4

22) What is the equation of the circle $(x-3)^2+(y+2)^2=7$ translated 2 left and 4 down?

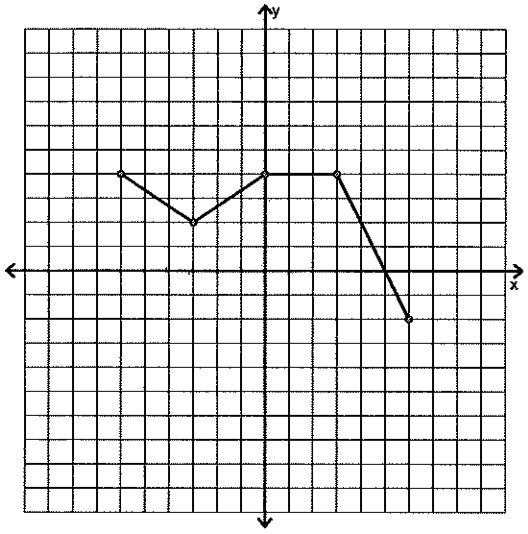
$(x-1)^2+(y+6)^2=7$ $(3,-2)$

23) Write the equation of the circle shown below:

$(x-3)^2+(y-4)^2=25$



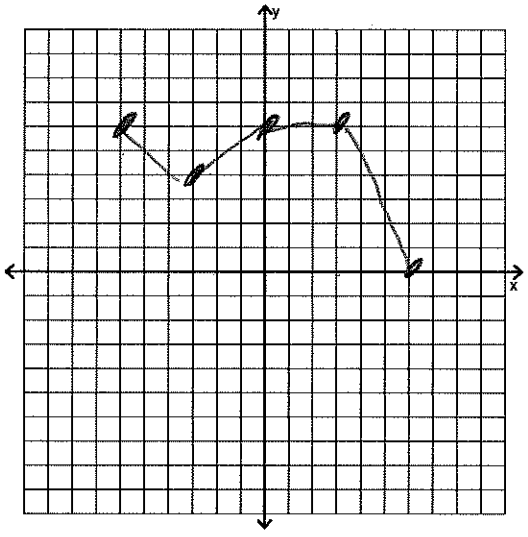
24) Given the following function, $f(x)$, graph each of the given transformations (hint: write out the words first, then apply the transformation rule (x,y) to the key ordered pairs of the function).



Key Ordered Pairs:

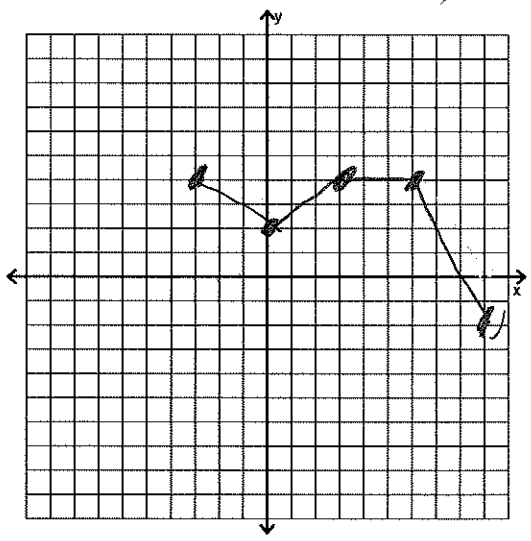
(-6, 4)
(-3, 2)
(0, 4)
(3, 4)
(6, -2)

a. $F(x)=f(x)+2$ $(x, y+2)$



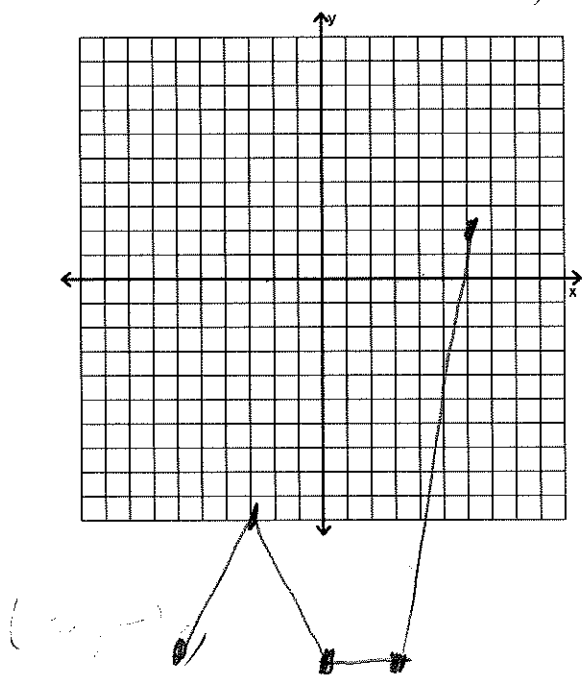
(-6, 6)
(-3, 4)
(0, 6)
(3, 6)
(6, 0)

b. $G(x)=f(x-3)$ $(x+3, y)$



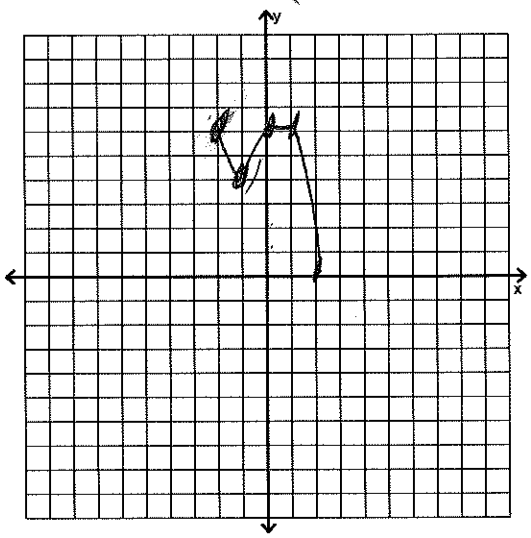
(-3, 4)
(0, 2)
(3, 4)
(6, 4)
(9, -2)

c. $q(x) = -3f(x) - 4$ $(x, -3y-4)$



$(-6, -16)$
$(-3, -10)$
$(0, -16)$
$(3, -16)$
$(6, 2)$

d. $r(x) = f(3x) + 2$ $\left(\frac{1}{3}x, y+2\right)$



$(-2, 6)$
$(-1, 4)$
$(0, 6)$
$(1, 6)$
$(2, 0)$