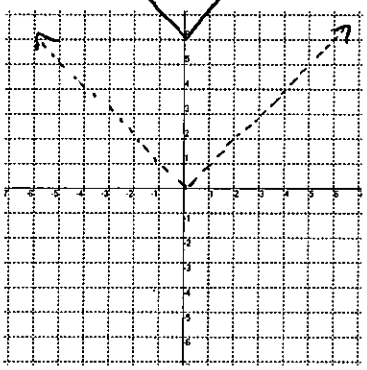
Algebra 2 **Review for 1st Quarter Final** *(Oct 13/19)* *Name:* Key *period:*

1. **List the transformations and sketch each graph. Determine the domain and range. Draw the parent function with dotted lines on each graph.**

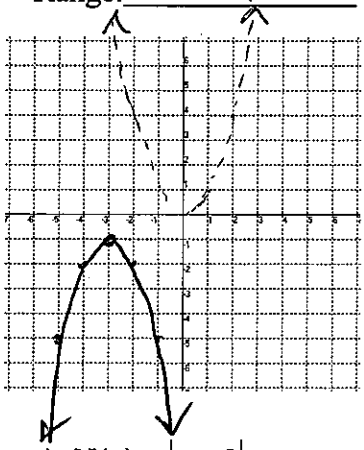
a) $f(x) = |x| + 6$

Parent: $y = |x|$
Reflection: yes (no)
Horizontal Shift: 0 L R
Vertical Shift: 6 (U) D
Domain: R
Range: $y \geq 6$



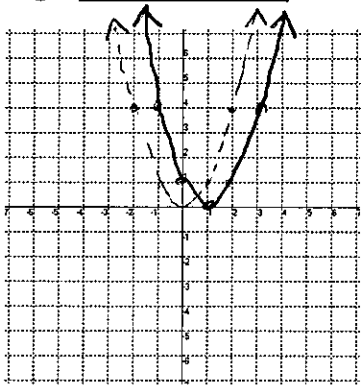
b) $g(x) = -(x+3)^2 - 1$

Parent: $y = x^2$
Reflection: (yes) no
Horizontal Shift: 3 (L) R
Vertical Shift: 1 U (D)
Domain: R
Range:



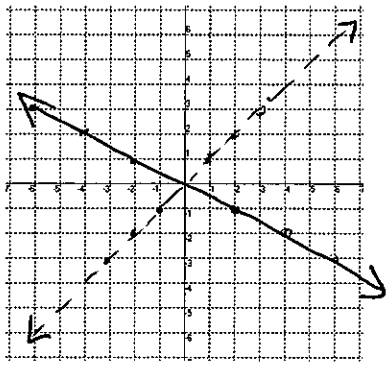
c) $h(x) = (x-1)^2$

Parent: $y = x^2$
Reflection: yes (no)
Horizontal Shift: 1 L (R)
Vertical Shift: 0 U D
Domain: R
Range:



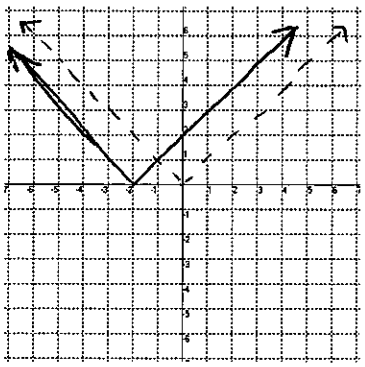
d) $M(x) = -\frac{1}{2}x$

Parent: $y = x$
Reflection: (yes) no
Vertical Shift: 0 U D
Slope: $-1/2$
Domain: R
Range:



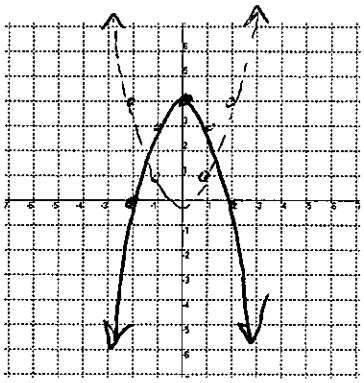
e) $N(x) = |x+2|$

Parent: $y = |x|$
Reflection: yes (no)
Horizontal Shift: 2 (L) R
Vertical Shift: 0 U D
Domain: R
Range:



f) $P(x) = -x^2 + 4$

Parent: $y = x^2$
Reflection: (yes) no
Horizontal Shift: 0 L R
Vertical Shift: 4 (U) D
Domain: R
Range:

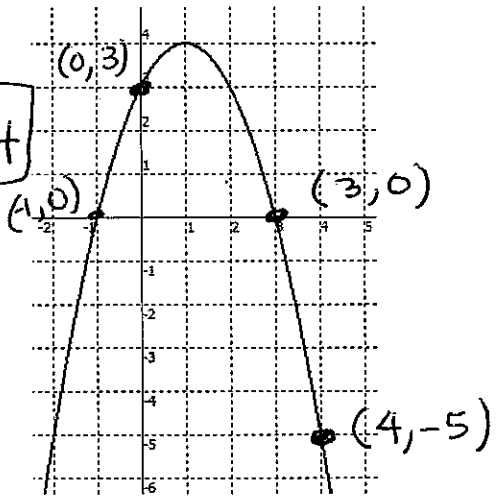


2. **Given $f(x) = |x|$ and $g(x) = x^2$, write the equations of the functions with the following transformations:**

a) Parent: $f(x)$ with a vertical shift down 2. $T(x) = |x| - 2$

b) Parent: $g(x)$ with a reflection and a horizontal shift right 5. $R(x) = -(x-5)^2$

3. **Given the graph of** $f(x) =$



a) Write the equation of the function $f(x) = -(x-1)^2+4$

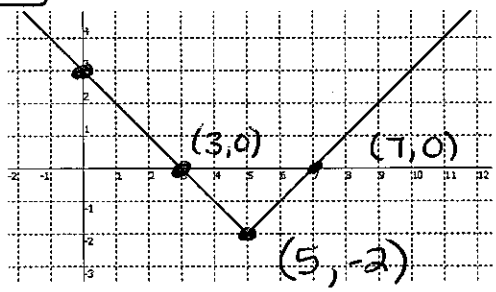
b) Find $f(0) = 3$

c) Find $f(4) = -5$

d) Find the y-intercept $(0, 3)$

e) Find the x-intercepts $(-1, 0)$ and $(3, 0)$

4. **Given the graph of** $g(x) =$



a) Write the equation of the function $g(x) = |x-5|-2$

b) Find $g(3) = 0$

c) Find $g(5) = -2$

d) Find the y-intercept $(0, 3)$

e) Find the x-intercepts $(3, 0)$ and $(7, 0)$

5. **What is the domain and range of the relation? Is the relation a function? Why, or why not?**

a) $f = \{(2, 3), (4, 7), (6, 9), (8, 9)\}$

D: $\{2, 4, 6, 8\}$ R: $\{3, 7, 9\}$

yes, no duplicate x values

b)

x	3	8	11	8	7
y	10	8	0	9	2

D: $\{3, 7, 8, 11\}$

R: $\{0, 2, 8, 9, 10\}$

Not a function, 8 is duplicate on the x-values

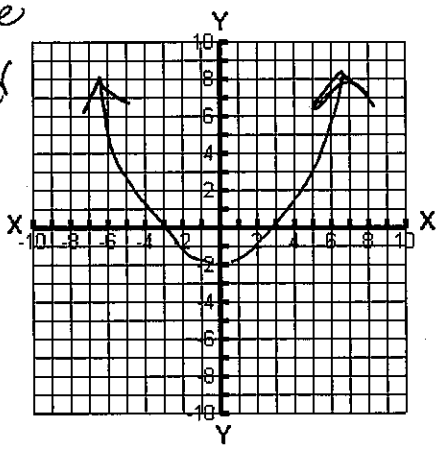
6. **Draw graphs of the following examples**

a) Function

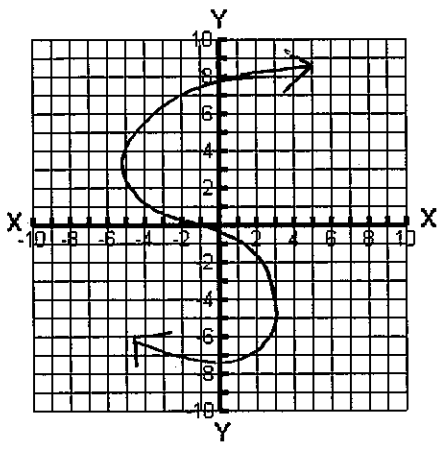
Domain: All real numbers

Range: $y \geq -2$

Possible answer is



b) Non-function



7. **Find the indicated function values if:** $f(x)=x+4$ $g(x)=x^2+1$ $h(x)=3x-2$

a) $f(1)$
$=(1)+4$
$=5$

b) $h(-6)$
$=3(-6)-2$
$=-18-2$
$=-20$

c) $f(h(5))$
$=(3(5)-2)+4$
$=(15-2)+4$
$=13+4$
$=17$

d) $g(g(0))$
$=((0)^2+1)^2+1$
$=(1)^2+1$
$=2$

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8. **Function Operations:** $f(x)=x+4$ $g(x)=x^2+1$ $h(x)=3x-2$

a) Find $f(g(x))$
$=((x)^2+1)+4$
$=x^2+1+4$
$=x^2+5$

b) Find $g(f(x))$
$=((x)+4)^2+1$
$=(x+4)(x+4)+1$
$=x^2+4x+4x+16+1$
$=x^2+8x+17$

c) Find $f(x)-h(x)$
$=x+4-(3x-2)$
$=x-4-3x+2$
$=-2x-2$

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9. **Find the domain of each function:**

a) $f(x)=x^2+4$
$\mathbb{R}$

b) $g(x)=\frac{2x+4}{x}$
$\mathbb{R}$ ex. $x\neq 0$

c) $W(x)=\frac{5}{x-3}$
$\mathbb{R}$ ex. $x\neq 3$

d) $M(t)=\frac{t+1}{(t-2)(t+5)}$
$\mathbb{R}$ ex. $x\neq 2,-5$

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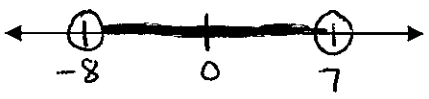
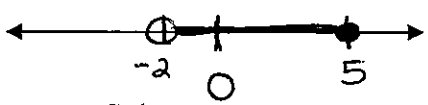
10. **Solve and graph:**

a) $-20<2x-4<10$
$+4 \quad +4 \quad +4$
$\frac{-16}{2}<\frac{2x}{2}<\frac{14}{2}$
$-8<x<7$

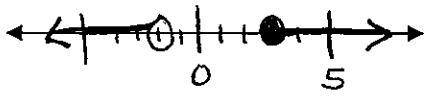


b) $-19\leq -4x+1<9$
$-1 \quad -1 \quad -1$
$\frac{-20}{-4}\leq\frac{-4x}{-4}<\frac{8}{-4}$
$5\geq x>-2$



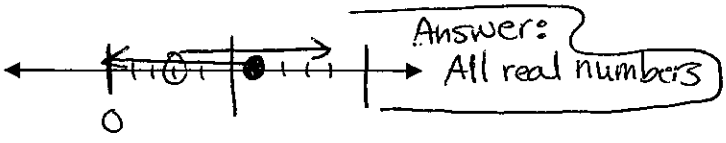
Solve

c) $x+3<1$ *or* $4x+8\geq 20$
$-3 \quad -3 \quad -8 \quad -8$
$x<-2 \quad 4x\geq 12$
$x\geq 3$



Solve

d) $10-2x<4$ *or* $3x\leq 18$
$-10 \quad -10 \quad \frac{3x}{3}\leq\frac{18}{3}$
$\frac{-2x}{-2}<\frac{-6}{-2} \quad x\leq 6$
$x>3$



e) $|q+5|=14$
(+) case: $q+5=14$, $q=9$
(-) case: $q+5=-14$, $q=-19$

f) $|2q+5|-14=-4$
$+14 \quad +14$
$|2q+5|=10$
(+) case: $2q+5=10$, $2q=5$, $q=5/2$
(-) case: $2q+5=-1$, $2q=-15$, $q=-15/2$