For review use the 4-step process worksheet, the domain quizzes done in class, the transformation review and the following:

Find the domain of the following fuctions:

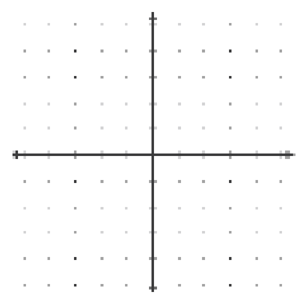
1) $f(x) = x^2 + 6$

2) $h(x) = \dfrac{x - 4}{x^3 - 36x}$

3) $f(x) = \sqrt{18 - x}$

Graph the function, and find the following:

4) $$f(x) = \begin{cases} -2x - 3 & \text{if} \quad x \le -2 \\ x & \text{if} \quad -2 < x \le 1 \\ x^2 & \text{if} \quad x > 1 \end{cases}$$



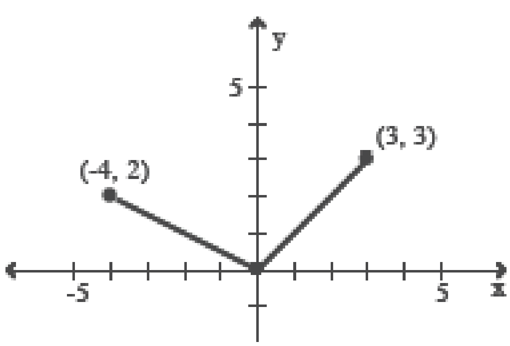
a) Find f(0)
f(2)
f(3)

b) Find Domain:
Range:

c) x-Intercept(s)

y-Intercept

5)



Write a definition for this function:

$$f(x) = \begin{cases} \underline{\hspace{3cm}} & \text{if} \quad \underline{\hspace{3cm}} \\ \underline{\hspace{3cm}} & \text{if} \quad \underline{\hspace{3cm}} \end{cases}$$

6. Given: $f(x)=\frac{x^2-4}{x-8}$ Find the following:

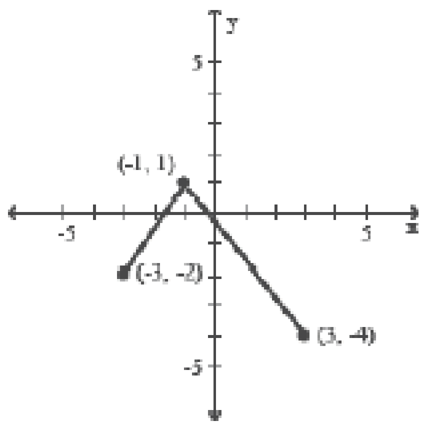
a) f(−1)

b) x if $f(x)=\frac{1}{2}$

c) the x-intercept(s)

d) the y-intercept

7. The graph o a function f is illustrated below. Use the graph of f to graph the following new funtion: $F(x)=-\frac{1}{3}f(x+2)+1$



8. List the transformation of $f(x)=-2\sqrt{-3x}-4$

0: Basic Function
1:
2:
3:
4:
5:

9. Using $y-\sqrt[3]{x}$ as the basic function, write a function who has the following transformation:

1: left 3
2: Vertical stretch factor of 3
3: Reflect the x-axis
4: Up 2

10. Using the "4-step process" or some similar process and: $f(x) = 2x^2 - 3x$

Find: $$\frac{f(x+h) - f(x)}{h}$$

For review use the 4-step process worksheet, the domain quizzes done in class, the transformation review and the following:

Find the domain of the following fuctions:

1) $f(x) = x^2 + 6$ $\Rightarrow$ $\mathbb{R}$, no denominator - no radical

2) $h(x) = \dfrac{x-4}{x^3 - 36x}$

Denominator $\neq 0$
$x^3 - 36x \neq 0$
$x(x^2 - 36) \neq 0$
$x(x-6)(x+6) \neq 0$
$x \neq 0 \quad x \neq 6 \quad x \neq -6$

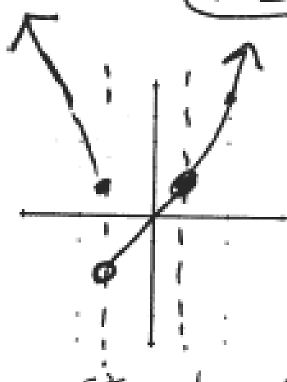
3) $f(x) = \sqrt{18 - x}$

Radicand ≥ 0
$18 - x \geq 0$
$-x \geq -18$
$x \leq 18$

Graph the function, and find the following:

4) $f(x) = \begin{cases} -2x-3 & \text{if } x \leq -2 \\ x & \text{if } -2 < x \leq 1 \\ x^2 & \text{if } x > 1 \end{cases}$

$\rightarrow x = 0$
$\rightarrow x = 2$
$x = 3$



$x \leq -2$

x	$-2x-3$	
-2	1	Solid
-3	3	

$-2 < x \leq 1$

x	y	
-2	-2	open
1	1	Solid

$x > 2$

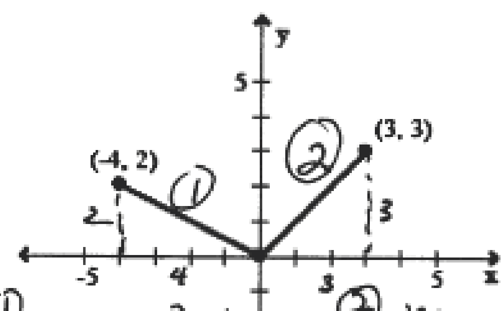
x	x^2
2	4
3	9
1	1

a) Find $f(0) = 0$
$f(2) = 2^2 = 4$
$f(3) = 3^2 = 9$

b) Find Domain: $\mathbb{R}$
Range:
$(-2, \infty)$

c) x-Intercept(s)
$(0, 0)$
y-Intercept
$(0, 0)$

5)



① $m = \frac{2}{4} = \frac{1}{2}$
$b = 0$
$y = -\frac{1}{2}x$

② $m = \frac{3}{3} = 1$
$b = 0$
$y = x$

Write a definition for this function:

$f(x) = \begin{cases} -\frac{1}{2}x & \text{if } -4 \leq x < 0 \\ x & \text{if } 0 \leq x \leq 3 \end{cases}$

6. Given: $f(x) = \frac{x^2-4}{x-8}$ Find the following:

a) f(−1) $= \frac{(-1)^2-4}{-1-8} = \frac{1-4}{-9} = \frac{-3}{-9} = \frac{1}{3}$

b) x if $f(x) = \frac{1}{2}$ $\frac{1}{2} = \frac{x^2-4}{x-8} =$ $2(x^2-4) = x-8$

$x=0$ $x=\frac{1}{2}$ $2x^2-8 = x-8$

$2x^2 = x$

$2x^2 - x = 0$

$x(2x-1) = 0$

0 $\frac{1}{2}$

c) the x-intercept(s)

$y=0$ $x^2-4=0$

$(x-2)(x+2)=0$

$(2,0)(-2,0)$

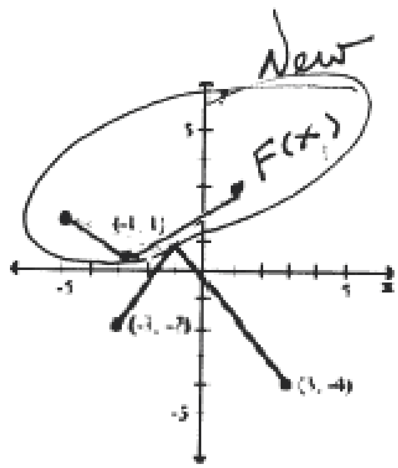
d) the y-intercept

$x=0$ $y = \frac{-4}{-8} = \frac{1}{2}$ $(0, \frac{1}{2})$

7. The graph o a function f is illustrated below. Use the graph of f to graph the following new funtion: $F(x) = -\frac{1}{2} f(x-2)+1$

List:

1. left 2
2. Reflect x-axis
3. V. Shrink factor $\frac{1}{2}$
4. up 1



+(−2)	x	y	$y \cdot -\frac{1}{2}$	+1
−5	−3	−2	1	2
−3	−1	1	$-\frac{1}{2}$	$\frac{1}{2}$
+1	3	−4	2	3

New

8. List the transformation of $f(x) = -2\sqrt{-3x} - 4$

0: Basic Function
1: Reflect y-axis
2: H. Shrink factor $\frac{1}{3}$
3: reflect x-axis
4: V. stretch factor 2
5: down 4

9. Using $y = \sqrt[3]{x}$ as the basic function, write a function who has the following transformation:

1: left 3 $\sqrt[3]{(x+3)}$
2: Vertical stretch factor of 3 $3\sqrt[3]{x+3}$
3: Reflect the x-axis $-3\sqrt[3]{x+3}$
4: Up 2

$-3\sqrt[3]{x+3}+2$ $y = -3\sqrt[3]{x+3}+2$

① $f(x+h) = 2(x+h)^2 - 3(x+h)$

$= 2(x^2+2xh+h^2) - 3x - 3h$

$= 2x^2+4xh+2h^2-3x-3h$

② $f(x) = 2x^2 - 3x$

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

$= \cancel{2x^2}+4xh+2h^2\cancel{-3x}-3h\cancel{-2x^2}\cancel{+3x}$

$= 4xh+2h^2-3h$

④ $\dfrac{f(x+h)-f(x)}{h} = \dfrac{4xh+2h^2-3h}{h}$

$= \dfrac{\cancel{h}(4x+2h-3)}{\cancel{h}}$

$= 4x+2h-3$