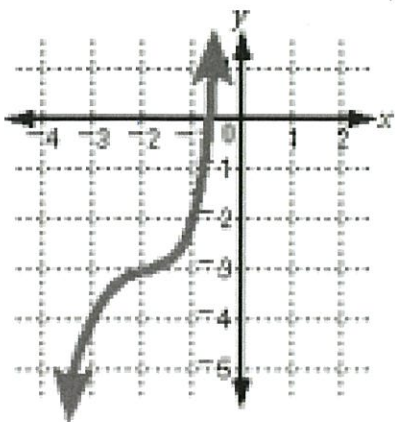


1. Evaluate the following function for  $f(-2)$ ,  $f(-3)$  and  $f(-0.7)$ .



$$f(-2) = -3 \quad (-2, -3)$$

$$f(-3) = -4 \quad (-3, -4)$$

$$f(-0.7) = 0 \quad (-0.7, 0)$$

2. Given  $f(x) = -2x^2 - 3x + 4$ , find  $f(-1)$ ,  $f(3a)$  and  $f(a-b)$ .

$$f(-1) = \underline{5}$$

$$\begin{aligned} f(-1) &= -2(-1)^2 - 3(-1) + 4 \\ &= -2(1) + 3 + 4 \\ &= -2 + 3 + 4 \\ &= 5 \end{aligned}$$

$$f(3a) = \underline{-18a^2 - 9a + 4}$$

$$\begin{aligned} f(3a) &= -2(3a)^2 - 3(3a) + 4 \\ &= -2(9a^2) - 9a + 4 \end{aligned}$$

$$f(a-b) = \underline{-2a^2 + 4ab - 2b^2 - 3a + 3b + 4} = -18a^2 - 9a + 4 + 3b + 4$$

3. Evaluate the following expression for  $x = -1$  and  $y = -3$ :

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

$$= \frac{1 - 9(-2)}{-6} = \frac{1+18}{-6} = \boxed{\frac{19}{-6}}$$

$$f(a-b) = -2(a-b)^2 - 3(a-b) + 4$$

$$= -2(a-b)(a-b) - 3a + 3b + 4$$

$$= -2(a^2 - 2ab + b^2) - 3a + 3b + 4$$

$$= -2a^2 + 4ab - 2b^2 - 3a + 3b + 4$$

For problems 1-6,

- a) Determine if the relation is a function. If it is, label it as one-to-one or many-to-one:  
b) Find the domain and range.

1.  $\{(-3,4), (-5,4), (-1,4), (2,4), (6,4)\}$

D =  $\{-5, -3, -1, 2, 6\}$

R =  $\{4\}$

Type of function? MTO

2.  $\{(-2,4), (6,3), (5,2), (-2,-3), (1,8)\}$

D =  $\{-2, 1, 5, 6\}$

R =  $\{-3, 2, 3, 4, 8\}$

Type of function? not a function  
- 2 repeats

3.  $y = -\sqrt{x+3} - 2$   
 $x+3 \geq 0$   
 $x \geq -3$

D =  $[-3, \infty)$

R =  $(-\infty, -2]$  calc

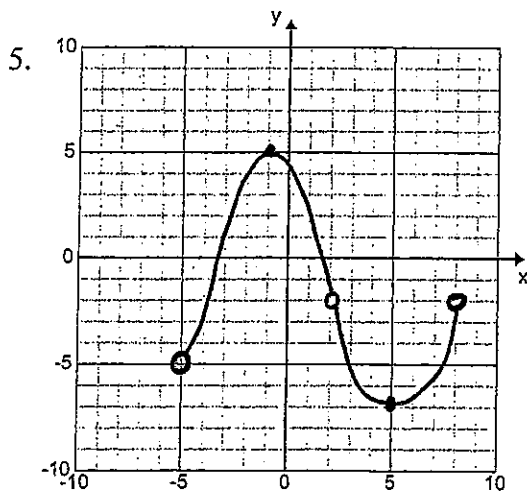
Type of function? Radical, OTO

4.  $y = 3x^2 + 4x - 2$

D =  $(-\infty, \infty)$

R =  $[-3.333, \infty)$  calc

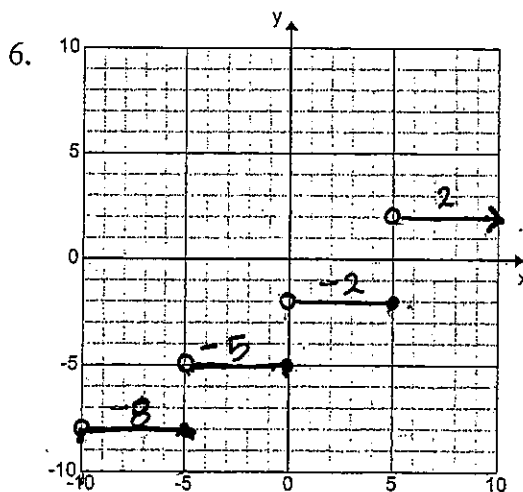
Type of function? Quadratic, MTO



D =  $(-5, 8)$

R =  $[-7, 5]$

Type of function? MTO



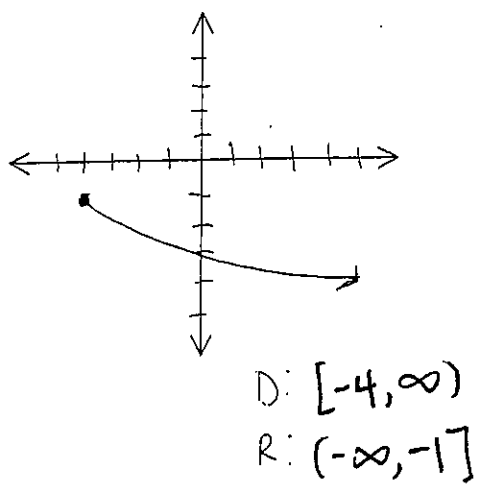
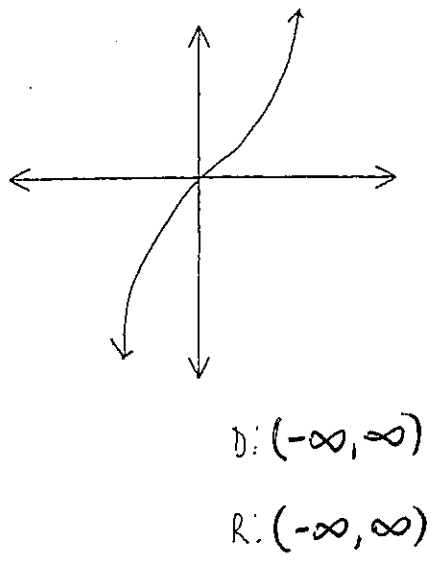
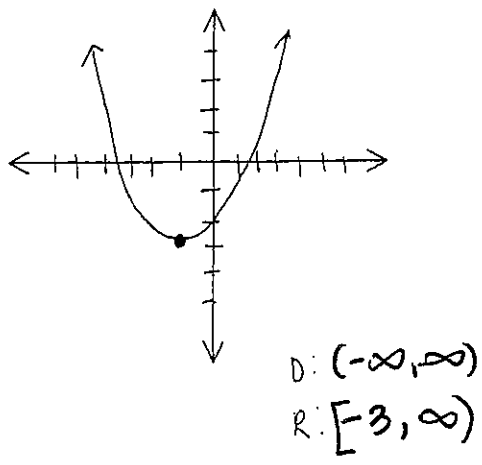
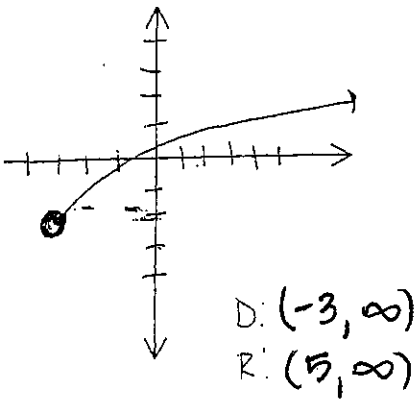
D =  $(-10, \infty)$

R =  $\{-8, -5, -2, 2\}$

Type of function? MTO

**DOMAIN:** all possible x values

**RANGE:** all possible y values



a)  $y = x - 3$   
Linear

Domain:  $(-\infty, \infty)$   
Range:  $(-\infty, \infty)$

e)  $y = \frac{5}{x-2}$   
Domain:  $(-\infty, 2) \cup (2, \infty)$   $x-2 \neq 0$   
Range:  $(-\infty, 0) \cup (0, \infty)$   $x \neq 2$

b)  $y = \frac{x^2-9}{x^2-4}$

Domain:  $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$   
Range:  $(-\infty, \infty)$

f)  $y = x^2 + 6$   
Domain:  $(-\infty, \infty)$   
Range:  $[6, \infty)$

c)  $y = -\sqrt{x+6}$   
 $x+6 \geq 0$   
 $x \geq -6$

$x^2 - 9 \neq 0$   
 $(x-3)(x+3) = 0$   $x \neq \pm 3$   
Domain:  $[-6, \infty)$   
Range:  $(-\infty, 0]$

g)  $y = \sqrt{x} + 4$   
 $x \geq 0$   
Domain:  $[0, \infty)$   
Range:  $[4, \infty)$

~~d)  $y = \sqrt{49 - x^2}$~~   
Domain: \_\_\_\_\_  
Range: \_\_\_\_\_

## Domain and Range

Graph the following functions and determine their domain and range.

Use Calc for range ONLY!

1.  $f(x) = -\sqrt{x-3} \geq 0$

Radical  
 $x-3 \geq 0$   
 $x \geq 3$

Domain:  $[3, \infty)$



Range:  $(-\infty, 0]$

Calc

2.  $f(x) = 3x + 5$

Linear

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, \infty)$

3.  $f(x) = x^2 - 1$

Quadratic

Domain:  $(-\infty, \infty)$

Range:  $[-1, \infty)$

4.  $f(x) = \frac{3}{1-x} \quad \begin{matrix} 1-x \neq 0 \\ x \neq 1 \end{matrix}$

Rational

Domain:  $(-\infty, 1), (1, \infty)$

Range:  $(-\infty, 0), (0, \infty)$

Calc

5.  $f(x) = -x^2 + 4$

Quadratic

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, 4]$

6.  $y = \frac{8}{x^2+16}$  ← will never be 0.

Rational

Domain:  $(-\infty, \infty)$

Range:  $(0, \frac{1}{2}]$

Calc (use max)

7.  $y = \sqrt{x^3+8} \geq 0$

Radical

$x^3+8 \geq 0$   
 $\sqrt[3]{x^3+8} \geq \sqrt[3]{-8}$   
 $x \geq -2$

Domain:  $[-2, \infty)$

Range:  $[0, \infty)$

Calc

Algebra 2 Honors

Chapter 1B: Domain and Range Extra Practice

1.  $f(x) = 2x + 3$  Linear

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, \infty)$

2.  $g(x) = x^2 + 1$  Quadratic

Domain:  $(-\infty, \infty)$

Range:  $[1, \infty)$

3.  $f(x) = 5x^2 + 2x - 1$  Quadratic

Domain:  $(-\infty, \infty)$

Range:  $[-1.2, \infty)$  (use min on calc)

4.  $g(x) = \frac{4}{x+1}$  Rational

Domain:  $(-\infty, -1), (-1, \infty)$   $x+1 \neq 0$   
 $x \neq -1$

Range:  $(-\infty, 0), (0, \infty)$

5.  $f(x) = \frac{3x}{x+5}$  Rational

Domain:  $(-\infty, -5), (-5, \infty)$   $x+5 \neq 0$   
 $x \neq -5$

Range:  $(-\infty, 3), (3, \infty)$

6.  $f(x) = \frac{1}{x} + \frac{3}{x+2}$  Rational

Domain:  $(-\infty, -2), (-2, 0), (0, \infty)$   $x \neq 0, x \neq -2$

Range:  $(-\infty, \infty)$

7.  $f(x) = -|x+5|$  Abs. Value

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, 0]$

8.  $f(x) = \sqrt{x-3}$  Radical

Domain:  $[3, \infty)$

Range:  $[0, \infty)$

9.  $g(x) = -x^2$  Quadratic

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, 0]$

10.  $g(x) = x^3 - 7$  Cubic

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, \infty)$

11.  $g(x) = 5 - \sqrt{x+1}$  Radical

Domain:  $[-1, \infty)$

Range:  $(-\infty, 5]$

12.  $g(x) = \frac{5x}{x^2 - 49}$  Rational

Domain:  $(-\infty, -7), (-7, 7), (7, \infty)$   $x^2 - 49 \neq 0$   
 $(x-7)(x+7) \neq 0$   
 $x \neq 7, x \neq -7$

Range:  $(-\infty, \infty)$

Finding Domain and Range Graphically

Name KEY  
 Date \_\_\_\_\_ Period \_\_\_\_\_

