

Focus:

ex: $y = \frac{3}{x-2}$

D: $(-\infty, 2), (2, \infty)$

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

ex: $y = \frac{5x}{x^2-16}$

D: $(-\infty, -4), (-4, 4), (4, \infty)$

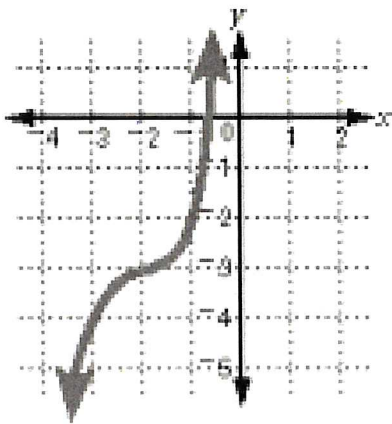
R: $\mathbb{R}$

ex: $y = \frac{5x}{x-2}$

D: $(-\infty, 2), (2, \infty)$

R: $(-\infty, 5), (5, \infty)$

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 $f(a-b)$.

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

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

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

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

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

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

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

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

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

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

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

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

Functions Quiz
Integrated III Academic

Name: KEY
Date: _____ Pd: _____

For problems 1-6,

- Determine if the relation is a function. If it is, label it as one-to-one or many-to-one.
- 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 = $(-\infty, -2]$

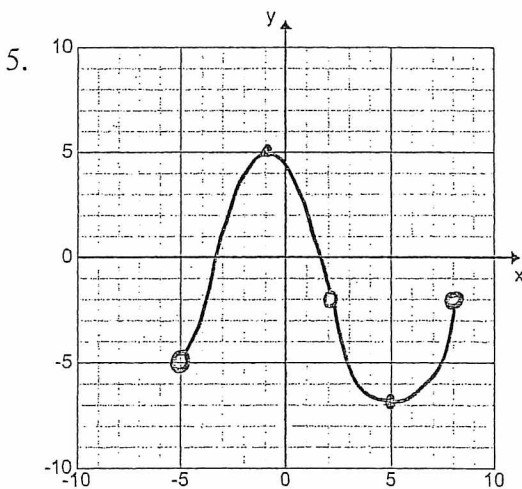
Type of function? Radical, OTO

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

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

R = $[-3\frac{1}{3}, \infty)$

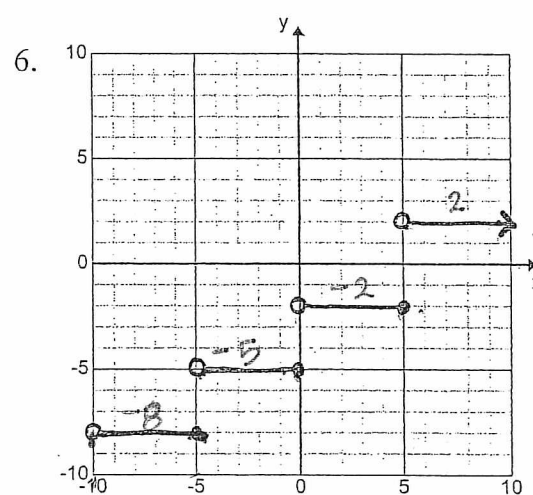
Type of function? Quadratic, mto



D = $(-5, 2) \cup (2, 8)$

R = $[-7, 5]$

Type of function? MTO



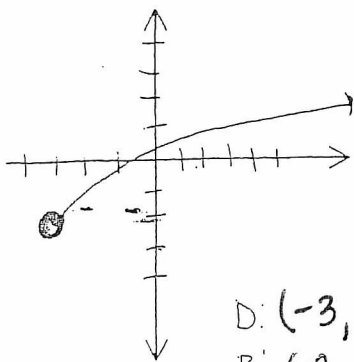
D = $(-10, \infty)$

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

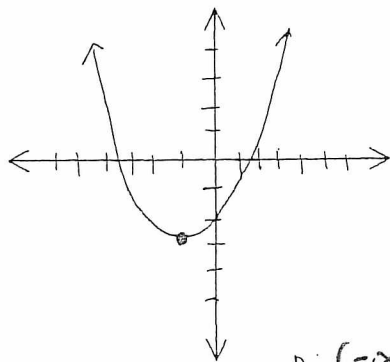
Type of function? MTO

DOMAIN: all possible x values

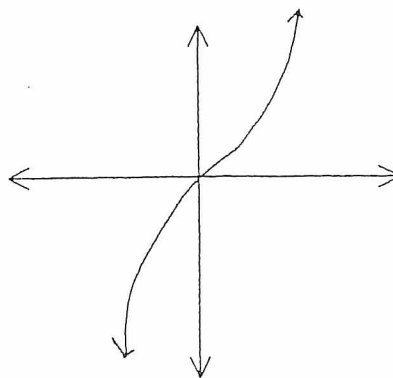
RANGE: all possible y values



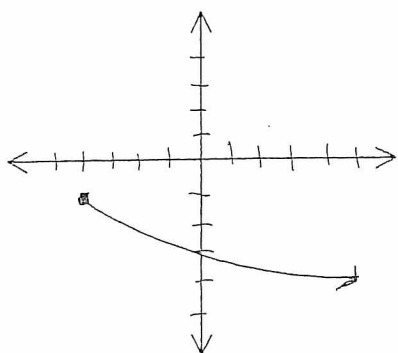
D: $(-3, \infty)$
R: $(-2, \infty)$



D: $(-\infty, \infty)$
R: $[-3, \infty)$



D: $(-\infty, \infty)$
R: $(-\infty, \infty)$



D: $[-4, \infty)$
R: $(-\infty, -17]$

a) $y = x - 3$

Linear

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

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

Rational

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

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

Domain: $[-6, \infty)$
Range: $(-\infty, 0]$

d) $y = \sqrt{49 - x^2}$

Domain: $[-7, 7]$
Range: $[0, 7]$

$49 - x^2 \geq 0$

$-x^2 \geq -49$

$x^2 \leq 49$

$x \leq \pm 7$

$x \leq 7$

$x \geq -7$

e) $y = \frac{5}{x-2}$

Rational

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

f) $y = x^2 + 6$

Quadratic

Domain: $(-\infty, \infty)$
Range: $[6, \infty)$

g) $y = \sqrt{x} + 4$
 $x \geq 0$

Mrs. Value

Domain: $[0, \infty)$
Range: $[4, \infty)$

use 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
 $x+1 \neq 0$

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

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

5. $f(x) = \frac{3x}{x+5}$ Rational
 $x+5 \neq 0$

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

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

6. $f(x) = \frac{1}{x} + \frac{3}{x+2}$ Rational
 $x \neq 0, x \neq -2$

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

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
 $x^2 - 49 \neq 0$

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

Range: $(-\infty, \infty)$ $x \neq 7, x \neq -7$