

Warm-Up:

Simplify.

1)  $\frac{x+3}{x^2+6x+9}$   
 ~~$(x+3)(x+3)$~~   $\frac{1}{x+3}$

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

$$\frac{x}{(x+1)(x-1)} + \frac{3x+3}{(x+1)(x-1)}$$

$$\frac{4x+3}{(x+1)(x-1)}$$

34, 44, 32, 46

32)  $\frac{1}{b+2} + \frac{1}{b-5}$   $\frac{(b+2)(b-5)}{(b+2)(b-5)}$   
 $\frac{b^2-b-3}{(b+2)(b-5)}$   
 $\frac{b-5+b+2}{b^2-b-3}$   $\frac{2b-3}{(b+2)(b-5)}$   
 $\frac{1}{b+1}$

39)  $\frac{x^2-9}{x-2}$   $\frac{(x+3)(x-3)}{(x-2)(x-2)}$   $\frac{(x+3)(x-3)}{(x-2)(x-2)}$   
 $\frac{x+3}{x-2}$   $\frac{(x+3)(x-2)}{(x-2)(x-2)}$   $\frac{x+3}{x-2}$   
 $(x+3)(x-2)$   $(x-3)(x+2)$

44)  $\frac{1}{(h-5)(h^2-9h+20)} - \frac{5}{(h-5)(h^2-10h+25)}$   $\frac{(h-4)}{(h-4)}$   
 $\frac{h-5}{LCD} + \frac{-5h+20}{LCD}$   
 $\frac{-4h+15}{(h-5)(h-4)}$

46)  $\frac{m^2+n^2}{m^2-n^2} + \frac{-m(m)}{-n+m(m)} + \frac{n}{m \cdot n} \frac{(m-n)}{(m-n)}$   
 $\frac{m^2+n^2}{LCD} + \frac{-m^2-mn}{LCD} + \frac{mn-n^2}{LCD}$   
 $\frac{0}{LCD}$   $\circ$

## Section 8-4: Direct, Joint, and Inverse Variation

Write an equation for each situation.

x	1	2	3	4	5	6	7
y	2	4	6	8	10	12	14

$$y = 2x$$

x	1	2	3	4	5	6	7
y	4	8	12	16	20	24	28

$$y = 4x$$

A **direct variation equation** can be written in the form  $y = kx$  where  $k$  is the **constant of variation**.

$y = kx$  in words:

$y$  varies directly as  $x$

**Joint variation** is written  $y = kxz$  where  $k$  is the constant of variation.

$y = kxz$  in words:

$y$  varies jointly as  $x$  and  $z$ .

**Inverse Variation** is written  $y = \frac{k}{x}$  where  $k$  is the constant of variation.

$y = k/x$  in words:  
 $y$  varies inversely as  $x$ .

Examples:

1) If  $y$  varies directly as  $x$  and  $y = -15$  when  $x = 5$ , find  $y$  when  $x = 3$ .

$$\begin{aligned}y &= kx \\ -15 &= k(5) \\ k &= -3\end{aligned}$$

$$\begin{aligned}y &= -3(3) \\ y &= -9\end{aligned}$$

2) Suppose  $y$  varies jointly as  $x$  and  $z$ . Find  $y$  when  $x = 10$  and  $z = 5$ , if  $y = 12$  when  $z = 8$  and  $x = 3$ .

$$\begin{aligned}y &= kxz \\ 12 &= k(3)(8) \\ 12 &= 24k \\ k &= \frac{1}{2}\end{aligned}$$

$$\begin{aligned}y &= \frac{1}{2}(10)(5) \\ y &= 25\end{aligned}$$

Examples:

3) If  $r$  varies inversely as  $t$  and  $r = -6$  when  $t = 2$ , find  $r$  when  $t = -7$ .

$$r = \frac{k}{t} \quad -6 = \frac{k}{2}$$

$$k = -12$$

$$r = \frac{-12}{-7}$$

$$r = \frac{12}{7}$$

Examples:

4) The voltage  $V$  in volts, in an electrical circuit varies inversely as the resistance  $R$  in ohms. The voltage in the circuit is 12 volts when the resistance is 240 ohms. Find the equation of variation.

$$V = \frac{k}{R}$$

$$12 = \frac{k}{240}$$

$$k = 2880$$

$$V = \frac{2880}{R}$$

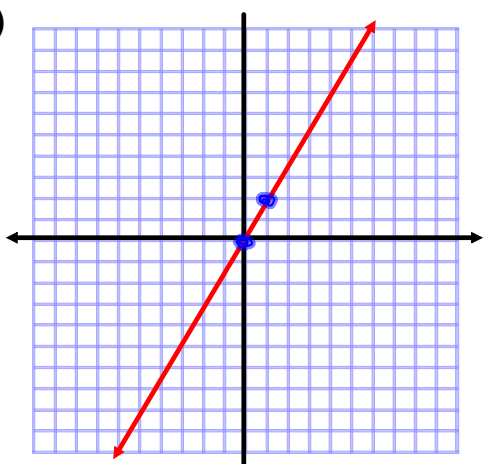
## Section 8-5: Classes of Functions

Open your book to pages 473-474.

Examples:

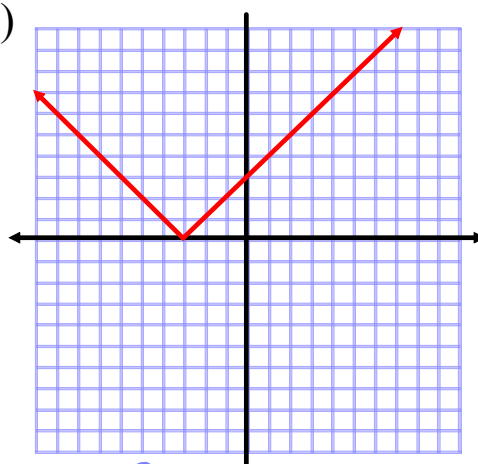
Identify the type of function represented by each graph.

1)



Direct  
Variation

2)



Absolute  
Value

Examples:

Identify the type of function represented by each equation.

3)  $y = x$

Identity

4)  $y = -3$

Constant

5)  $y = 4x^2$

Quadratic

Homework: Worksheet 8-4, 8-5

Section 8-4 Vocab

Quiz over 8-1, 8-2 Next Class