

**Use Algebraic Notation AND Show All of Your Work**

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Determine whether each relation is a function. (Circle the correct response.)

Give the domain and range for each relation.

[4, 6, 6 pts]

1.  $\{(4,5), (6,7), (8,8)\}$

Function OR Not a Function

Domain Set: \_\_\_\_\_

Range Set: \_\_\_\_\_

[4, 6, 6 pts]

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

Function OR Not a Function

Domain Set: \_\_\_\_\_

Range Set: \_\_\_\_\_

For  $g(x) = 2x^2 + 3x - 1$ , find the indicated function values.

[5 pts]

2.  $g(0)$

$g(0) =$  \_\_\_\_\_

[8 pts]

3.  $g(-4)$

$g(-4) =$  \_\_\_\_\_

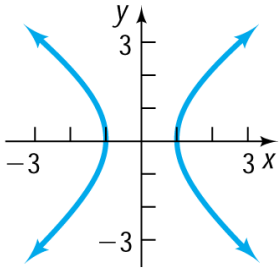
[10 pts]

4.  $g(5a)$

$g(5a) =$  \_\_\_\_\_

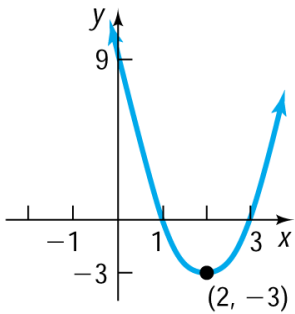
Identify graphs in which  $y$  is a function of  $x$ .  
[6 pts each]

5.



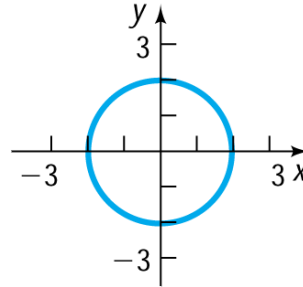
Function OR Not a Function

6.



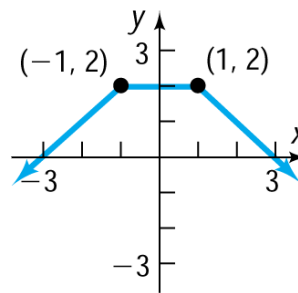
Function OR Not a Function

7.



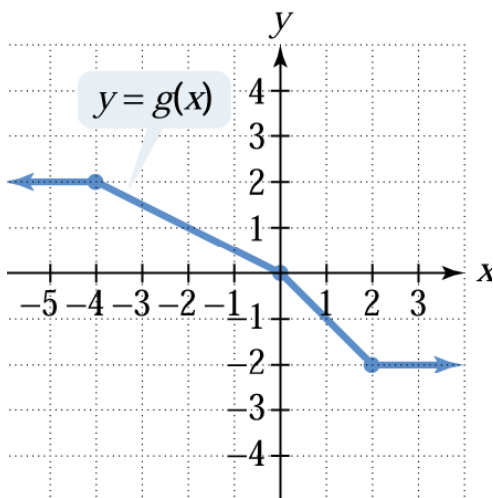
Function OR Not a Function

8.



Function OR Not a Function

Use the graph of  $g$  to find the following values. [6 pts each]



9.  $g(-4)$

$g(-4) = \underline{\hspace{2cm}}$

10.  $g(2)$

$g(2) = \underline{\hspace{2cm}}$

11. For what value of  $x$  is  $g(x) = 1$ ?

$x = \underline{\hspace{2cm}}$

12. For what value of  $x$  is  $g(x) = -1$ ?

$x = \underline{\hspace{2cm}}$

[8, 8 pts]

13. (a) Explain how to determine whether a relation is a function.

(b) What is a function?

[9 pts]

14. Which **one** of the following is true? (*Circle the correct letter.*)

- (a) All relations are functions.
- (b) No two ordered pairs of a function can have the same second component and different first components.
- (c) The graph of every line is a function.
- (d) A horizontal line can intersect the graph of a function in more than one point.

*Find the domain of each function.*

[8 pts]

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

Domain Set: \_\_\_\_\_

[10 pts]

16.  $f(x) = \frac{2x}{x-3}$

Domain Set: \_\_\_\_\_

For  $g(x) = 2x + 7$  and  $f(x) = 3x^2 - 4x$ , find the indicated functions.

[9 pts]

17.  $(f + g)(x)$

$$(f + g)(x) = \underline{\hspace{10cm}}$$

[9 pts]

18.  $(f - g)(x)$

$$(f - g)(x) = \underline{\hspace{10cm}}$$

[11 pts]

19.  $(fg)(x)$

$$(fg)(x) = \underline{\hspace{10cm}}$$

[9 pts]

20.  $\left(\frac{f}{g}\right)(x)$

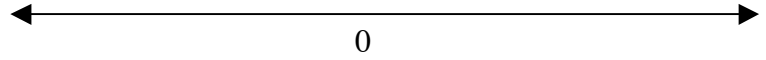
$$\left(\frac{f}{g}\right)(x) = \underline{\hspace{10cm}}$$

Solve each inequality, and state the solution set in INTERVAL notation.

Graph this solution set on a number line.

[8, 3, 4 pts]

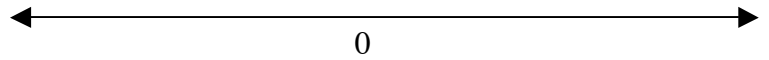
21.  $17 - 3x \leq 29$



Solution Set: \_\_\_\_\_

[11, 3, 4 pts]

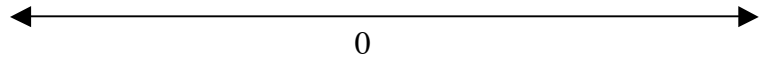
22.  $3 + 2(3 - 2x) < 5(2 - 3x)$



Solution Set: \_\_\_\_\_

[16, 3, 4 pts]

23.  $\frac{x-4}{6} \geq \frac{x-2}{9} + \frac{5}{18}$



Solution Set: \_\_\_\_\_

[8, 4 pts]

24. When solving an inequality, under what conditions will it be necessary to **change the direction of the inequality symbol**? Give one example.

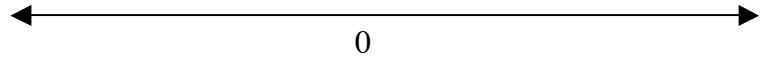
Example:

Solve each compound inequality, and state the solution set in INTERVAL notation.

Graph this solution set on a number line.

[16, 5, 6 pts]

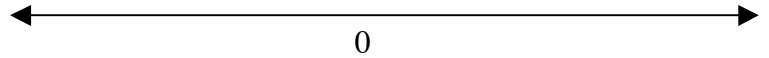
25.  $4(1-x) < -6$  AND  $\frac{x-7}{5} \leq -2$



Solution Set: \_\_\_\_\_

[16, 5, 6 pts]

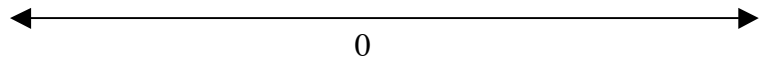
26.  $x-1 \leq 7x-1$  AND  $4x-7 < 3-x$



Solution Set: \_\_\_\_\_

[16, 5, 6 pts]

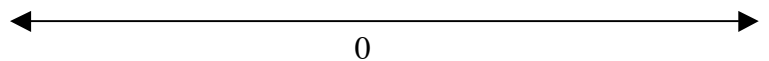
27.  $4x+3 < -1$  OR  $2x-3 \geq -11$



Solution Set: \_\_\_\_\_

[16, 5, 6 pts]

28.  $2x-5 \leq -11$  OR  $5x+1 \geq 6$



Solution Set: \_\_\_\_\_

Solve each equation, and state the solution set.

[18, 5 pts]

29.  $|2x - 1| = 7$

Solution Set: \_\_\_\_\_

[18, 5 pts]

30.  $|x + 1| + 5 = 3$

Solution Set: \_\_\_\_\_

[20, 5 pts]

31.  $|6y - 2| + 4 = 32$

Solution Set: \_\_\_\_\_

[20, 5 pts]

32.  $|2x - 4| = |x - 1|$

Solution Set: \_\_\_\_\_