MATH 64 **Name**
Test 1-SAMPLE

Use Algebraic Notation AND Show All of Your Work

Determine whether each relation is a function. (Circle the correct response.)
Give the domain and range for each relation.

[4, 6, 6 pts]

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

Function OR Not a Function

Domain Set:_____

Range Set:_____

[4, 6, 6 pts]

1b. $\{(3,4),(3,5),(4,4),(4,5)\}$

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. $g(-4)$

$g(-4)=$_____

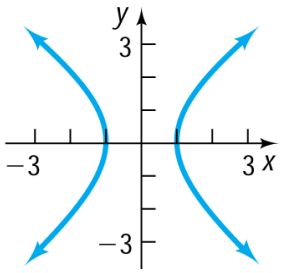
[10 pts]

4. $g(5a)$

$g(5a)=$_____

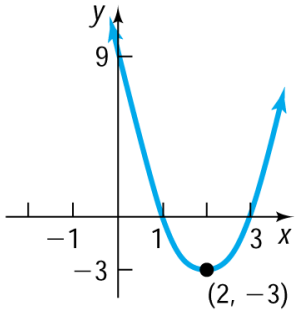
Identify graphs in which ***y*** *is a function of* ***x****.*
[6 pts each]

5.



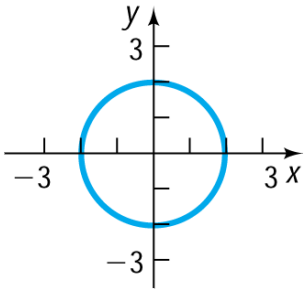
Function OR Not a Function

6.



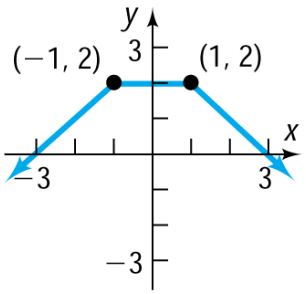
Function OR Not a Function

7.



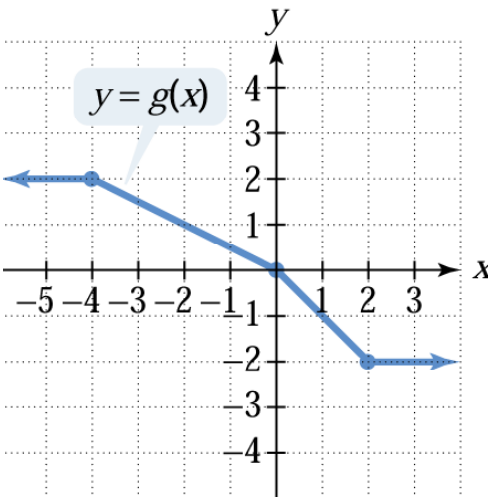
Function OR Not a Function

8.



Function OR Not a Function

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



9. $g(-4)$

$g(-4)=$_____

10. $g(2)$

$g(2)=$_____

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

$x=$_____

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

$x=$_____

[8, 8 pts]

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

(b) What is a function?

[9 pts]

14. Which **<u>one</u>** 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. $f(x) = \dfrac{2x}{x-3}$

Domain Set: _____

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

[9 pts]

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

$(f+g)(x)=$_____

[9 pts]

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

$(f-g)(x)=$_____

[11 pts]

19. $(fg)(x)$

$(fg)(x)=$_____

[9 pts]

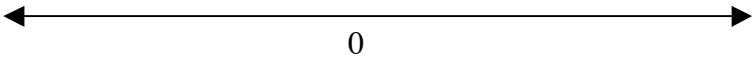
20. $\left(\frac{f}{g}\right)(x)$

$\left(\frac{f}{g}\right)(x)=$_____

Solve each inequality, and state the solution set in INTERVAL notation.
Graph this solution set on a number line.

[8, 3, 4 pts]

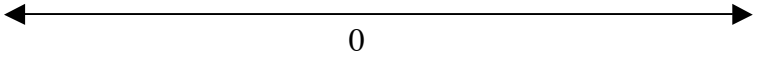
21. $17 - 3x \leq 29$



Solution Set:_____

[11, 3, 4 pts]

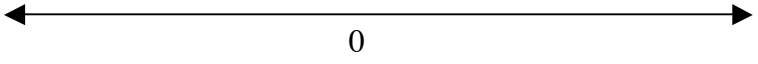
22. $3 + 2(3 - 2x) < 5(2 - 3x)$



Solution Set:_____

[16, 3, 4 pts]

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



Solution Set:_____

[8, 4 pts]

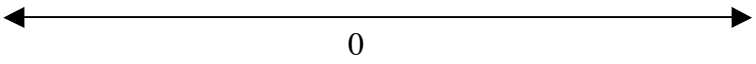
24. When solving an inequality, under what conditions will it be necessary to **change the direction of the inequality symbol**? Give <u>one</u> example.

<u>Example:</u>

Solve each compound inequality, and state the solution set in INTERVAL notation.
Graph this solution set on a number line.

[16, 5, 6 pts]

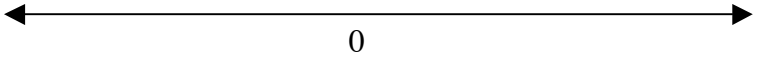
25. $4(1-x) < -6$ AND $\dfrac{x-7}{5} \leq -2$



Solution Set:_____

[16, 5, 6 pts]

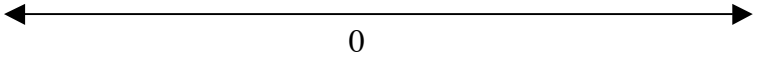
26. $x-1 \leq 7x-1$ AND $4x-7 < 3-x$



Solution Set:_____

[16, 5, 6 pts]

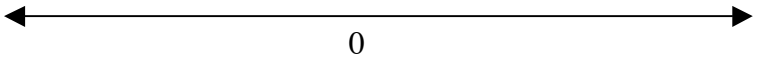
27. $4x+3 < -1$ OR $2x-3 \geq -11$



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. $\left|2x-1\right|=7$

Solution Set:_____

[18, 5 pts]

30. $\left|x+1\right|+5=3$

Solution Set:_____

[20, 5 pts]

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

Solution Set:_____

[20, 5 pts]

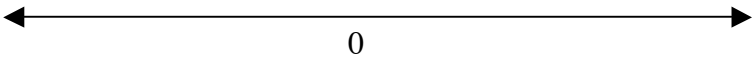
32. $\left|2x-4\right|=\left|x-1\right|$

Solution Set:_____

Solve each absolute value inequality, and state the solution set in INTERVAL notation.
Graph this solution set on a number line.

[20, 5, 6 pts]

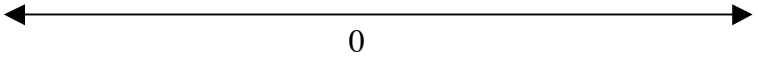
32. $\left|\frac{3a-3}{4}\right| \leq 6$



Solution Set:_____

[18, 5, 6 pts]

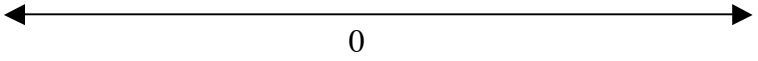
33. $|w+4| > -12$



Solution Set:_____

[18, 5, 6 pts]

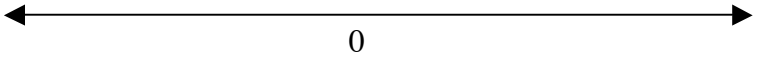
34. $|b-3| < -2$



Solution Set:_____

[23, 5, 6 pts]

35. $3|2y-1|+2 \geq 8$



Solution Set:_____

For $f(x)=4x-3$, *and* $g(x)=5x^2-2$, *find the following:*
(Be sure to state your result in simplified form.)

[16 pts]

36. $(f\circ g)(x)=$

$(f\circ g)(x)=$_____

[16 pts]

37. $(g\circ f)(x)=$

$(g\circ f)(x)=$_____

[14 pts]

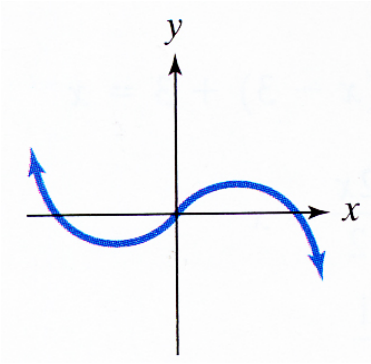
38. $(f\circ g)(2)=$

$(f\circ g)(2)=$_____

Identify the graphs that represent functions that are one-to-one and that have inverse functions. (Circle the correct response.)

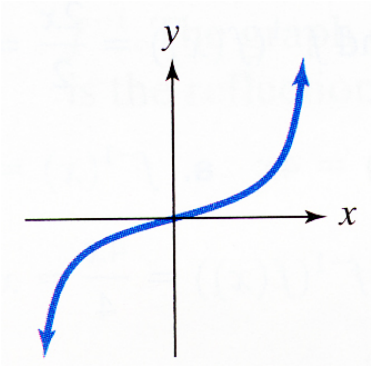
[5 pts each]

39.



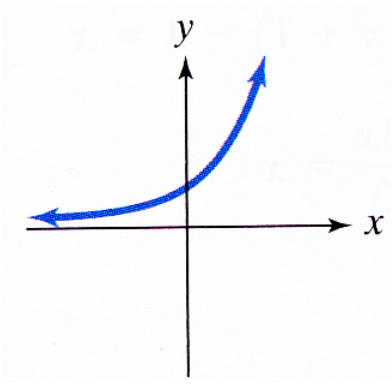
Has an Inverse Function, OR Does Not have an Inverse Function

40.



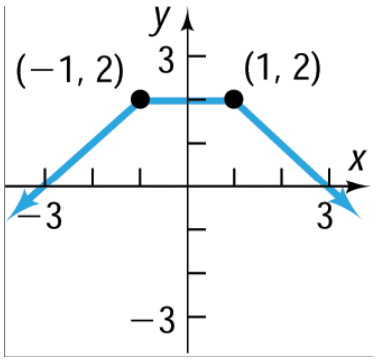
Has an Inverse Function, OR Does Not have an Inverse Function

41.



Has an Inverse Function, OR Does Not have an Inverse Function

42.

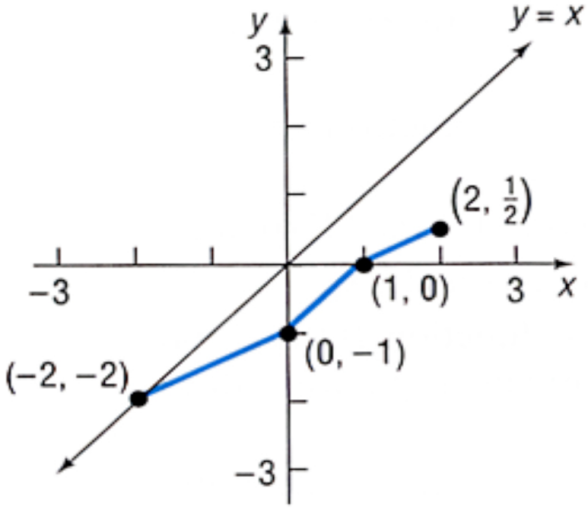


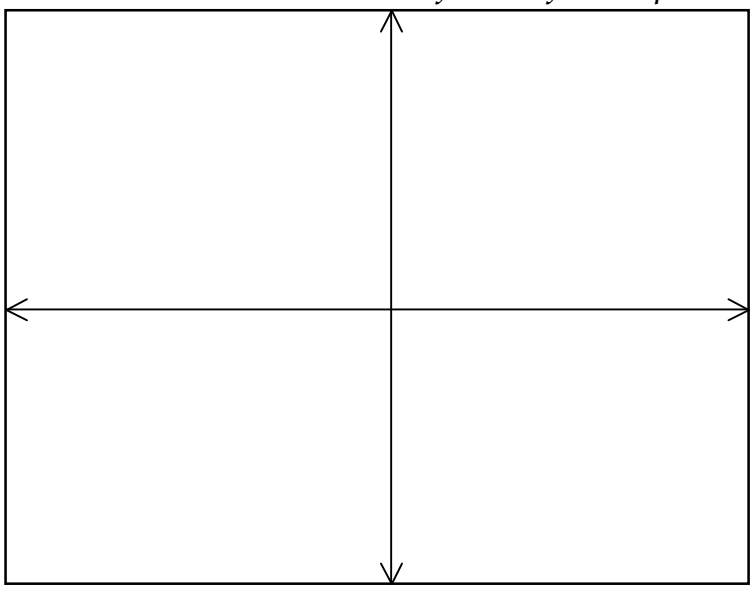
Has an Inverse Function, OR Does Not have an Inverse Function

The graph of a one-to-one function f is illustrated below. Draw the graph of the inverse function f^{-1}, and plot at least 4 points. Label and state the coordinates of each of these points.

[16, 4 pts]

43.





[20, 12, 12 pts]

44. *For the on-to-one function* $f(x)=4x-3$,

(a) *find an equation for* $f^{-1}(x)$, *the inverse function, then*

(b) *verify that your equation is correct by showing that* $f\left(f^{-1}(x)\right)=x$, *and* $f^{-1}\left(f(x)\right)=x$.

(Be careful with your notation and show your steps.)

(a) *find the inverse of* $f(x)=4x-3$

(a) $f^{-1}(x)=$_____

(b) *Show* $f\left(f^{-1}(x)\right)=x$

(b) *Show* $f^{-1}\left(f(x)\right)=x$