Name: Key Period ____ Date _____

Test Review - Relations, Functions, Domain, Range & Simplifying

page 1 to 6

Identify the independent and dependent variables in the following situations.

1. The length in millimeters L of the candle after it has burned t minutes.

   a) independent variable: t dependent variable: L

   b) discrete or continuous situation? Continuous; because t & L can be any value within a given range

   c) Describe a reasonable domain and range. To what number set(s) do these numbers belong? positive Real numbers

   Reasonable Domain: $0 \le t \le 240$

   Range: $0 \le L \le 150$

2. As the sales of concert tickets t increases, the revenue r for the concert also increases.

   a) independent variable: t dependent variable: r

   b) discrete or continuous situation? Discrete; because, the number of tickets can only be whole numbers - NO ½ tickets or ¼ tickets.

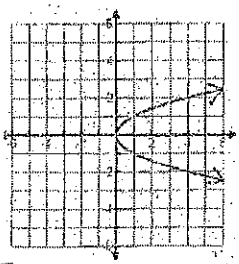
   c) Describe a reasonable domain and range. To what number set(s) do these numbers belong? Whole numbers

   Reasonable Domain: {0, 10, 20, ... 1000}

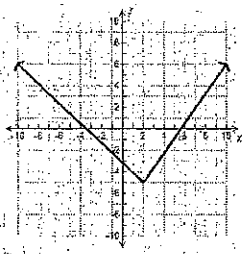
   Range: {0, 1, 2, ... 100}

   * Assume a ticket would cost $1

For 3 – 5, do the relations represent a function? Why or why not?

3. 

   No Fails vertical Line Test

4. 

   Yes It passes vertical Line test

5.

x	6	0	6	-1
y	0	6	-1	6

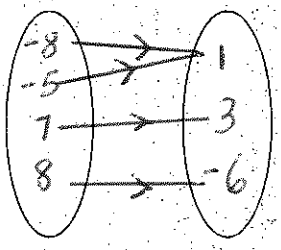
   No because one input {6} has two outputs {0, -1}

6. Give the domain and range of the relation. Tell whether the relation is a function or not and why.

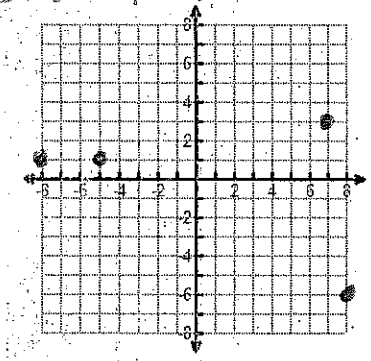
{(-8, 1), (-5, 1), (7, 3), (8, -6)} Domain: {-8, -5, 7, 8} Range: {1, 3, -6}

(Yes) or No Why? because for each value of x (input) there is only one value of y (output)

Create a mapping that represents this relation:



Graph the relation:

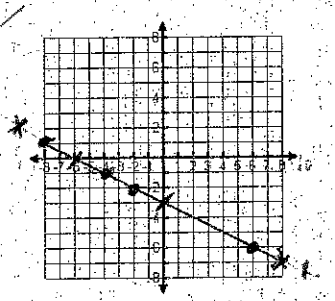


7. The graph of a function passes through the set of points {(-8, 1), (-4, -1), (-2,-2), (8,-7)}. Which of the following is not another representation of this function?

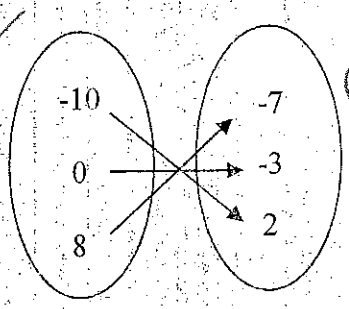
A ✓

x	y
-6	0
0	-3
10	-8

B ✓



C ✓



D ✗ $f(x)=\frac{1}{2}x-3$

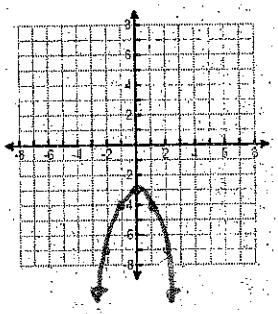
checking (D)

x	
-8	-7
-4	-5
-2	-4

8. Create a table of values then graph the following functions. Use a graphing calculator for support.

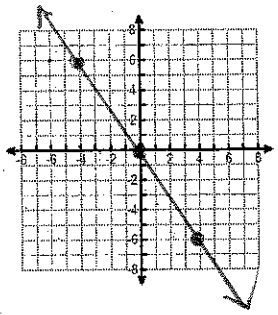
$y=-x^2-3$

x	y
-2	-7
-1	-4
0	-3
1	-4
2	-7



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

x	y
-4	6
0	0
4	-6



9. A DVD club costs $25 to join. Each DVD that is rented costs $2. Write a rule in function notation for the situation. Identify the independent and dependent variables. Independent: # of DVD(d) Dependent: cost (C)

Function: $C(d)=2d+25$ Ind: _____ Dep: _____

Is this relationship discrete or continuous? Discrete; No ½ or ¼ DVDs

Describe the domain and range. Domain: whole numbers Ex. {0,1,2...}
Range {25, 27, ...}

Identify the independent and dependent variables in each situation.

10. Yvonne reads about 20 pages a night before she goes to bed. *N* stands for the number of nights she has read and *P* stands for the total number of pages.

Independent: N

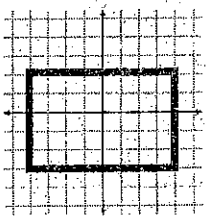
Dependent: P

11. Peter coaches soccer clinics and charges $15.00 per player. *T* stands for the total amount of money he makes and *P* stands for the number of player that sign up.

Independent: P

Dependent: T

State the domain and range for the following graphs in both set notation and interval notation. Are they functions?

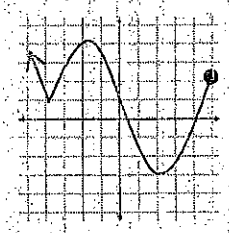


Domain: $-4 \leq x \leq 4$

Range: $-3 \leq y \leq 2$

NOT A FUNCTION

13.



Domain: $-\infty < x \leq 5$ or $x \leq 5$

Range: $-3 \leq y \leq 4$

14. Shoe sizes for both men and women are a function of the length of the foot in inches. The functions below represent men's and women's shoe size with respect to x, the length of the foot in inches.

Men's shoe size	$m(x) = 4x - 32.5$
Women's shoe size	$w(x) = 4x - 31$

Which statement below is not a true statement?

A A women with a foot 10 inches long wears a size 9 shoe. true → $w(10) = 4(10) - 31 \rightarrow 9$ ✓

B A man with a foot 10.5 inches long wears a size 9.5 shoe. true → $m(10.5) = 4(10.5) - 32.5 \rightarrow 9.5$ ✓

C The shoe size for a women with a foot 9 inches long smaller than the shoe size for a man with a foot 9 inches long. True

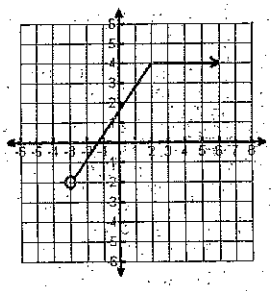
(D) If a man and a women have the same length foot, the man's shoe size will be smaller. Not Always

15. Which graph has the following domain and range?

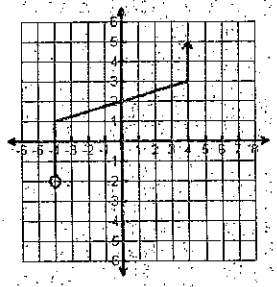
Domain: $x > -3$

Range: $-2 \leq y \leq 4$

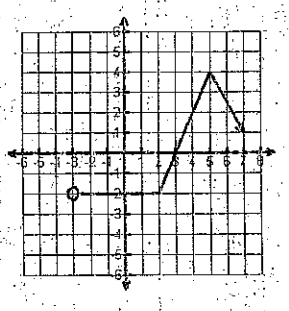
A



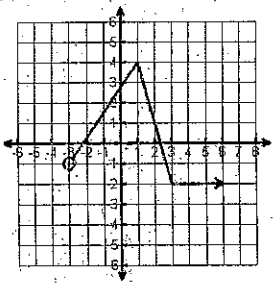
B



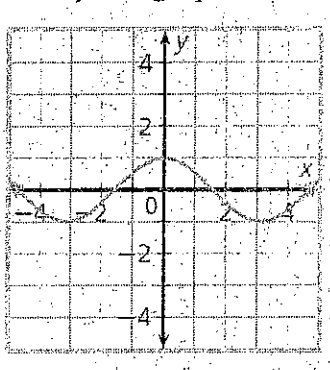
C



(D)



16. Determine the range of the function represented by the graph.

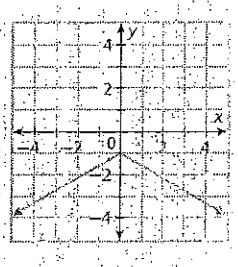


A. $-1 < y \leq 1$ B. $-1 < y < 1$

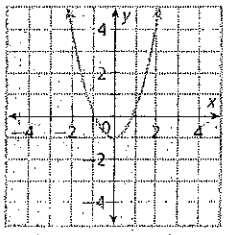
C. $-1 \leq y \leq 1$ D. All real numbers

17. Which function has a range that is greater than or equal to -1?

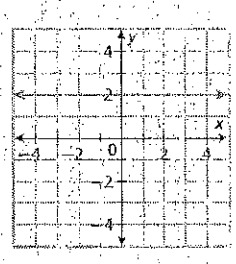
A.



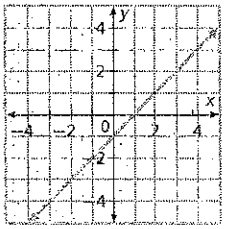
B.



C.



D.



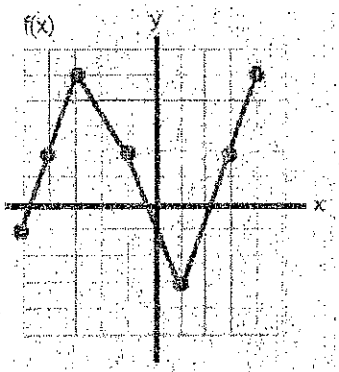
18. Find the range of $s(x) = 3x^2 - 4$ if the domain is {-3, 0, 2}. Range {23, -4, 8}

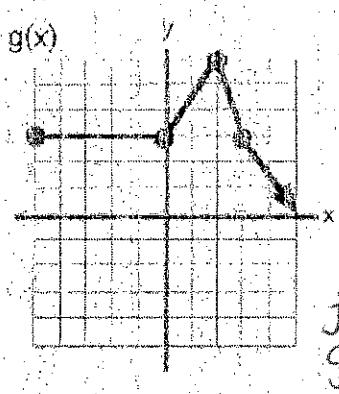
$S(-3) = 3(-3)^2 - 4 = 23$

$S(0) = 3(0)^2 - 4 = -4$

$S(2) = 3(2)^2 - 4 = 8$

Answer the following questions using the graphs of the functions f(x) and g(x) shown below.





$f(4) = 2$

$g(-3) = 3$

19. Find x when f(x) = -1. X = 0

20. $2f(4) - 7g(-3)$ = -17

$2(2) - 7(3) = -17$

21. Determine the domain and range of f(x). D: $-5 \leq x \leq 4$ R: $-3 \leq y \leq 5$

22. Determine the domain and range of g(x). D: $-5 \leq x < \infty$ or $x \geq -5$ R: $-\infty < y \leq 6$ or $y \leq 6$

23. For which function below does $f(-3) = 2$?

A $f(x) = x^2 - 4x - 1$

$f(-3) = (-3)^2 - 4(-3) - 1$

$= 9 + 12 - 1 = 20$ X

(-3, 2) B $f(x) = 2x^2 + 5x - 1$

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

$= 18 - 15 - 1 = 2$ ✓

C $f(x) = 3x^2 - 5x - 5$

$f(-3) = 3(-3)^2 - 5(-3) - 5$

$= 3(9) + 15 - 5 = 28$ X

24.

It costs \$40 plus \$20 per day to rent a car. Which of the following describes this relationship in function notation?

A. $f(d) = 20d$

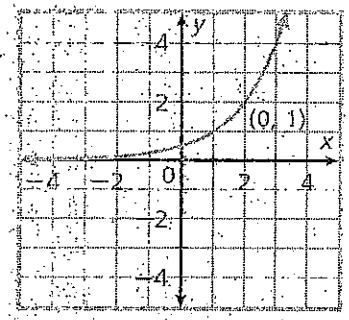
B. $f(d) = 40d$

C. $f(d) = 20d + 40$

D. $f(d) = 40d + 20$

25.

What is the range of the function represented by this graph?



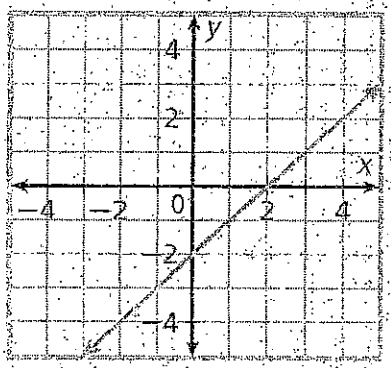
A. All real numbers

B. $0 \leq y \leq 1$

C. $y \geq 0$

D. $y > 0$

Determine the range of the function represented by the graph.



A. y is greater than or equal to -2 than 0.

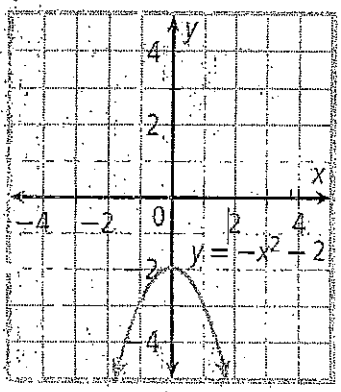
B. All real numbers.

C. y is greater than or equal to 0.

D. y is greater than or equal to -2.

27.

Which notation represents the function shown in the graph?



A. $f(x) = -x^2 - 2$

B. $f(y) = -x^2 - 2$

C. $f(-x^2 - 2) = y$

D. $f(-2) = -x^2$