

## Functions

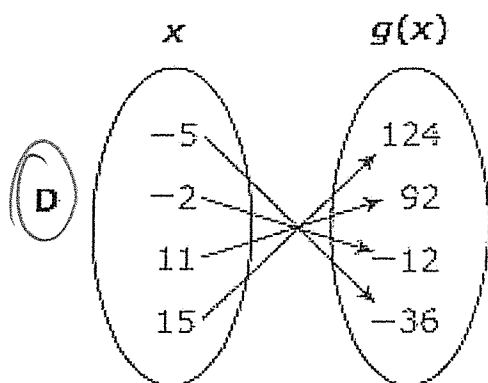
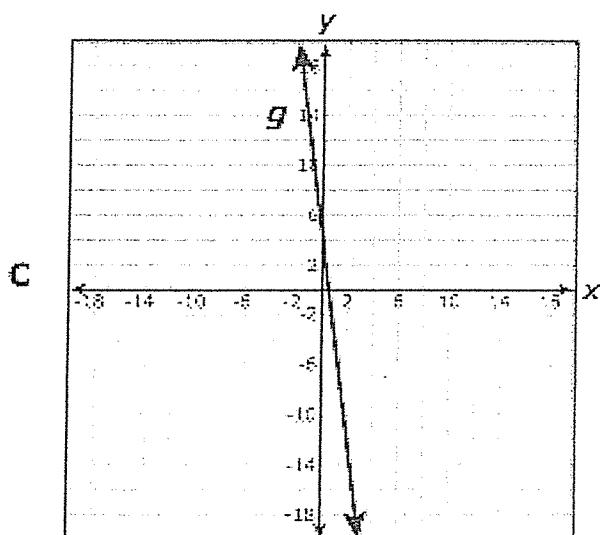
- 41 Which representation shows the same relationship as  $g(x) = \frac{4}{3}(6x - 3)$ ?

A

$x$	$g(x)$
28	3
12	1
-20	-3
-36	-5

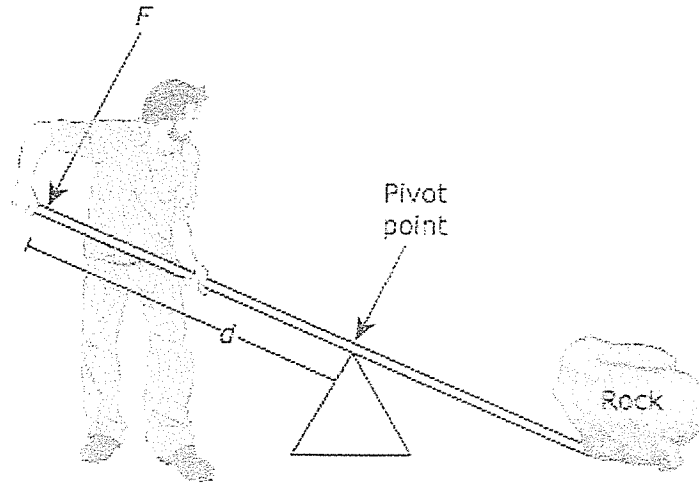
INPUT FUNCTIONS INTO  
GRAPHING CALCULATOR AND  
CHECK TABLE FOR POINTS  
AND LOOK AT GRAPH.

- B  $g = \{(13, 108), (10, 94), (4, 36), (-3, -20)\}$



## Equations

- 18 A farmer uses a lever to move a large rock. The force required to move the rock varies inversely with the distance from the pivot point to the point the force is applied. A force of 50 pounds applied to the lever 36 inches from the pivot point of the lever will move the rock. Which function models the relationship between  $F$ , the amount of force applied to the lever, and  $d$ , the distance of the applied force from the pivot point?



F  $d = \frac{F}{1,800}$

G  $d = \frac{86}{F}$

H  $F = \frac{1,800}{d}$

J  $F = \frac{d}{86}$

$$y = ax$$

$$F = \frac{a}{d}$$

$$50 = \frac{a}{36}$$

$$(36) 50 = \frac{a}{36} (36)$$

$$1800 = a$$

$$F = \frac{1800}{d}$$

- 42 If  $f(x) = \frac{2}{3}x^2 + 8x$ , what is the value of  $f(6)$ ?

Record your answer and fill in the bubbles on your answer document.

INPUT INTO GRAPHING CALCULATOR  
AND CHECK  $x=6$  ON CALCULATOR.

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## Equations

- 23 What is the equation in standard form of the line that passes through the point  $(4, -8)$  and has a slope of  $\frac{1}{4}$ ?

- A  $x - 4y = 36$   
 B  $x - 4y = 28$   
 C  $x - 4y = -36$   
 D  $x - 4y = -28$

INPUT EACH EQUATION INTO GRAPHING CALCULATOR OR DESMOS FOR  $(4, -8)$  ON TABLE OR GRAPH.

- 14 A senior employee who works 16 hours earns \$39.50 more than a junior employee who works 18 hours. The senior employee earns \$14 per hour. What is the hourly pay in dollars and cents for the junior employee?

Record your answer and fill in the bubbles on your answer document.

EQUATION FOR SITUATION

$$16(14) = 18x + 39.50$$

$$224 = 18x + 39.50$$

$$\begin{array}{r} 224 = 18x + 39.50 \\ -39.50 \qquad \qquad -39.50 \\ \hline 184.50 = 18x \end{array}$$

SOLVE

$$184.50 = 18x$$

$$\frac{184.50}{18} = \frac{18x}{18}$$

$$10.25 = x$$

## Equations

- 31 Airline passengers pay \$439 to fly to California. For this price, customers may check 2 pieces of luggage. There is a fee of \$25 for each additional piece of luggage a passenger wants to check. Which function can be used to find the amount in dollars a passenger has to pay to fly with  $p$  pieces of luggage, where  $p \geq 2$ ?

A  $c = 25p + 439$

**B**  $c = 25(p - 2) + 439$

C  $c = \frac{p}{25} + 439$

D  $c = \frac{p-2}{25} + 439$

You Pay ONLY FOR EXTRA BAGS  
(P-2)

- 10 A city employee paints curbs in parking lots and replaces road signs. It takes 0.5 hour to paint a parking lot curb and 2.5 hours to replace a road sign. The function below can be used to find  $c$ , the number of parking lot curbs the employee paints when he replaces  $r$  road signs in a 40-hour workweek.

$$c = \frac{40 - 2.5r}{0.5}$$

If the employee painted 20 curbs in one week, how many road signs did he replace that week?

F 20

G 30

H 0

**J 12**

$$(15) \quad 20 = \frac{40 - 2.5r}{0.5}$$

$$\begin{array}{r} 10 = 40 - 2.5r \\ -40 \quad \quad -40 \\ \hline \end{array}$$

$$-30 = -2.5r$$

$$\frac{-30}{-2.5} = \frac{-2.5r}{-2.5}$$

$$12 = r$$

YOU CAN ALSO  
SUBSTITUTE  
VALUES FOR  
"C" AND "r"  
AND CHECK.  
 $20 = \frac{40 - 2.5(12)}{0.5}$

## Functions

19 Which set of ordered pairs represents  $y$  as a function of  $x$ ?

NO REPEATING "X"

A  $\{(-9, 2), (0, 6), (1, -2), (-3, 6)\}$

B  $\{(-1, 0), (4, 3), (-7, -3), (-1, -8)\}$

C  $\{(3, 2), (-4, -2), (3, 1), (-4, 1)\}$

D  $\{(5, 4), (2, 3), (1, 1), (2, 4)\}$

A FUNCTION

CANNOT HAVE AN  
"X" VALUE THAT  
REPEATS.

48 If  $f(x) = (x - 3)^2 + 4$  and  $g(x) = x^3 + 2$ , which statement is true?

F  $f(-2) = g(-3)$

G  $f(0) = g(-1)$

H  $f(8) = g(3)$

J  $f(2) = g(1)$

METHOD 1 : SUBSTITUTE EACH VALUE INTO "X", COMPLETE THE MATH TO CHECK THAT EACH RESULT IS THE SAME

$$f(x) = (x - 3)^2 + 4$$

$$f(8) = (8 - 3)^2 + 4$$

$$f(8) = 5^2 + 4$$

$$f(8) = 25 + 4$$

$$\boxed{f(8) = 29}$$

$$g(x) = x^3 + 2$$

$$g(3) = (3)^3 + 2$$

$$g(3) = 27 + 2$$

$$\boxed{g(3) = 29}$$

OR

INPUT EACH FUNCTION INTO GRAPHING CALCULATOR AND CHECK TO SEE WHICH "Y" VALUES ARE THE SAME ON THE TABLE,

## Functions

- 20 For the function  $w$ ,  $w(9) = -7$ , and  $w(-7) = 9$ . If  $y = w(x)$ , what is the value of  $y$  when  $x = -7$ ?

Record your answer and fill in the bubbles on your answer document.

$w(9)$  AND  $w(-7)$  IS THE SAME AS "Y".  
THE QUESTION IS ASKING WHAT IS "Y" WHEN  
 $x = -7$ .  $-7$  IS THE "X" VALUE ABOVE.  
 $9$  IS THE "Y" VALUE 9

- 18 The population of a town is currently 9,000. The function  $p = 9,000 + 8t^2$  can be used to estimate  $p$ , the population of the town  $t$  years from now. Based on this function, which statement is true?
- F** The population of the town is increasing at a constant rate.
- G** The population of the town will reach 10,000 between 11 and 12 years from now.
- H** The population of the town will increase by 256 people two years from now.
- J** The population of the town will increase and then decrease.

INPUT THE FUNCTION INTO GRAPHING  
CALCULATOR AND LOOK AT THE TABLE  
AND INTERPRET THE RELATIONSHIP BETWEEN  
"X" AND "Y".

## Functions

36 The set of ordered pairs below represents some points on the graph of function  $f$ .

$$\{(3, 11), (-1, 3), (5, 15), (-4, -3), (-7, -9)\}$$

What is the parent function of  $f$ ?

**F**  $y = x$

**G**  $y = 2^x$

**H**  $y = x^2$

**J**  $y = \sqrt{x}$

PARENT FUNCTION IS THE FUNCTION THAT MAKES A LINE.

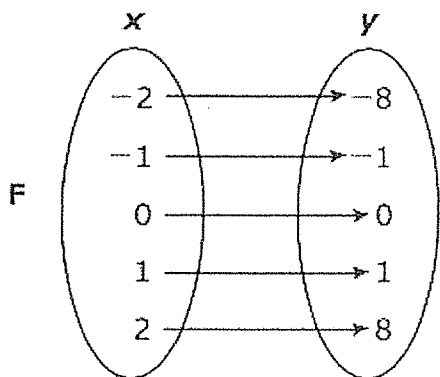
GRAPH THE POINTS ON DESMOS THEN INPUT EACH EQUATION TO CHECK WHICH EQUATION MAKES A SIMILAR GRAPH.

THESE POINTS MAKE A LINE AND EQUATION "F" MAKES A LINE.

## Functions

46 Which representation does not show  $y$  as a function of  $x$ ?

WHICH ONE SHOWS A REPEATING "X"



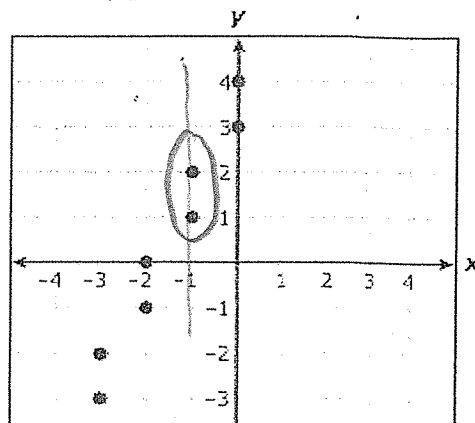
**H**

x	y
2	-6
5	-1
7	-1
8	3

**G**  $\{(-1, -2), (0, 1), (2, 4), (7, 7)\}$

**J**

VERTICAL LINE TEST



## Functions

- 10 The value of  $y$  varies directly with  $x$ . Which function represents the relationship between  $x$  and  $y$  if  $y = \frac{20}{3}$  when  $x = 30$ ?

F  $y = 200x$

G  $y = \frac{2}{9}x$

H  $y = \frac{110}{3}x$

J  $y = \frac{9}{2}x$

SUBSTITUTE THE "X" AND "Y" VALUES INTO THE EQUATIONS TO SEE WHICH ONE IS TRUE.

$$y = \frac{2}{9}x$$

$$\frac{20}{3} = \frac{2}{9}(30)$$

$$\frac{20}{3} = \frac{60}{9}$$

$$6.\overline{66} = 6.\overline{66} \quad \boxed{\text{TRUE}}$$

- 50 If the value of  $y$  varies inversely with  $x$ , which function represents the relationship between  $x$  and  $y$  if  $y = 48$  when  $x = 3$ ?

F  $y = \frac{144}{x}$

G  $y = \frac{16}{x}$

H  $y = \frac{x}{16}$

J  $y = \frac{x}{144}$

SUBSTITUTE "X" AND "Y" VALUES INTO THE EQUATIONS TO SEE WHICH ONE IS TRUE.

$$y = \frac{144}{x}$$

$$48 = \frac{144}{3}$$

$$48 = 48 \quad \boxed{\text{TRUE}}$$



Area/Perimeter/Volume

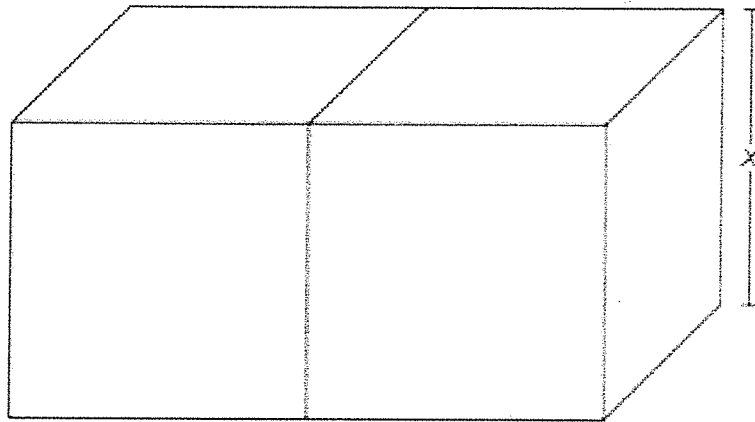
31 The measure of an obtuse angle is represented by  $(9x + 27)^\circ$ . Which is not a possible value for  $x$ ?

- A 7.1
- B 12.3
- C 16.9
- D 6.8**

$$9x + 27$$
$$9(6.8) + 27$$
$$88.2$$

SUBSTITUTE EACH  
VALUE FOR "X" TO  
SEE WHICH ONE  
GIVES ANSWER LESS  
THAN 90.

44 The volume of two identical cubes is related to the edge length of the cubes.



Which function represents the combined volume of these cubes?

- F**  $y = 2x^3$
- G  $y = x^3$
- H  $y = 8x^3$
- J  $y = 2x^2$

$V = x^3$  OR  $V = lwh$   
SINCE ITS A CUBE, ALL SIDES ARE EQUAL.  
2 CUBES WOULD BE 2 TIMES  
 $x^3$ .

Area/Perimeter/Volume

- 12 A rectangular prism has a width of  $x$  inches, a length of  $x^2y$  inches, and a height of  $y^2$  inches. Which expression represents the volume in cubic inches of this rectangular prism?

F  $4x^2y^2$

G  $4x^3y^3$

H  $x^2y^2$

J  $x^3y^3$

$$V = lwh \quad V = x^2y \cdot x \cdot y^2$$

$$V = x^3y^3$$

- 6 The perimeter of a rectangle is 42 centimeters. The length of the rectangle can be represented by  $(x + 4)$ , and its width can be represented by  $(2x - 7)$ . What are the dimensions of this rectangle in centimeters?

F Length = 10 and width = 11

G Length = 8 and width = 13

H Length = 6 and width = 15

J Length = 12 and width = 9