



1. Let $C = \{9, x, e, 0\}$ and $D = \{8, 4, p, 0\}$.

$C \cap D =$

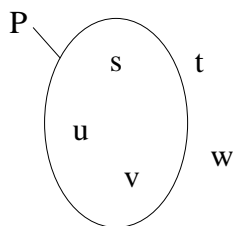
2. Let $X = \{1, 5, 11, 13\}$ and $Y = \{2, 3, 5, 11\}$.

$X \cup Y =$

3. Solve $-\frac{3}{4}q = -\frac{2}{3}$ and verify the answer.

4. Solve the equation $8t - 6 = -2t + 14$ and verify your answer.

5. Consider the diagram below showing set P and other elements.



Which of the elements belong to set P?

6. Write 756 as a product of distinct prime numbers, each raised to an exponent.

7. Represent 123×10^8 as scientific notation

8. What is the value of n if $(8^{-2})^{-4} = 8^n$?

9. The table below displays values of two related variables x and y .

x	6	12	18	24	30
y	2	4	6	8	10

Which of the following equations describes the relationship between x and y ?

A. $y = 3x$

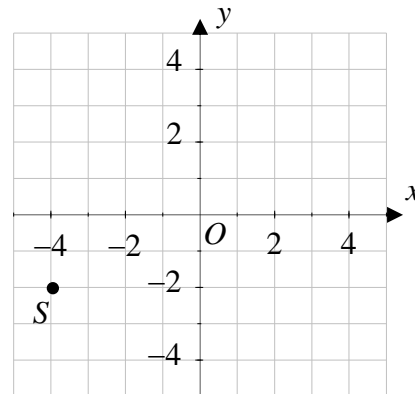
B. $y = 6x$

C. $y = \frac{x}{3}$

D. $y = \frac{x}{2}$

E. $y = x - 6$

10. What are the coordinates of point S plotted on the coordinate plane below?



A. (2, 4)

B. (-4, 2)

C. (-4, -2)

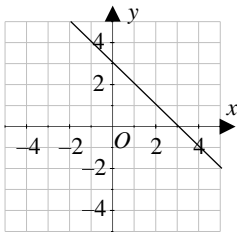
D. (2, -4)

E. (-2, -4)

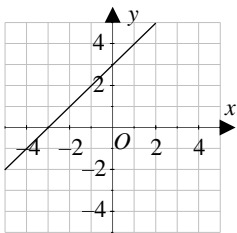


11. Which of the following is the graph of $y = -x + 3$?

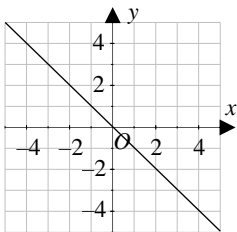
A.



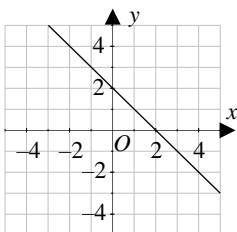
B.



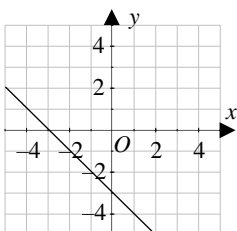
C.



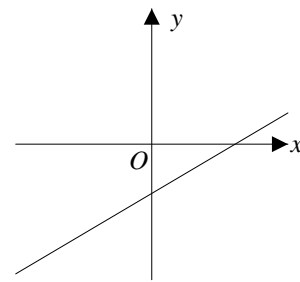
D.



E.



12. Consider the line graphed below.



Which of the following is true about this line?

- I. It has negative y-intercept
- II. It has negative slope.
- III. It has positive slope.

- A. Only I
- B. Only II
- C. Only III
- D. I and II
- E. I and III

13. Which of the following gives the x -intercept of the line $2x + 3y = 12$?

- A. (4, 0)
- B. (0, 4)
- C. (6, 0)
- D. (0, 6)
- E. (6, 4)

14. Which of the following is true about lines l and m defined below?

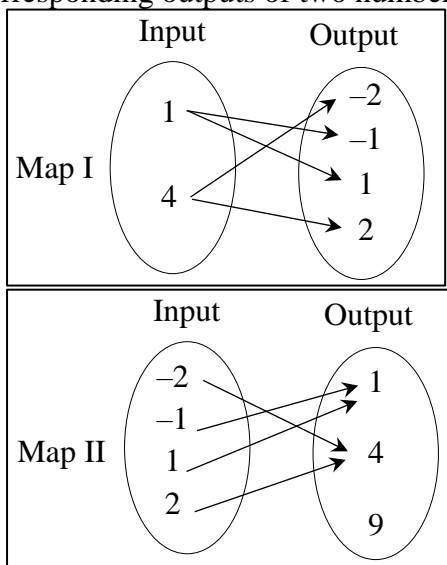
$$l: y = 2x + 3$$

$$m: 2y - 4x = 5$$

- A. The two lines pass through the origin.
- B. The two lines are perpendicular.
- C. The two lines are parallel.
- D. The two lines are coincident.
- E. The two lines are intersecting.



15. The two maps below show the inputs and corresponding outputs of two number machines.



Which of the following is true?

- A. Only map I represents a function.
- B. Only map II represents a function.
- C. Both maps represent a function.
- D. Both maps represent a relation but not a function.
- E. None of the two maps represents a relation.

16. Which of the following sets of ordered pairs defines a function?

- I. (1, 1), (1, 2), (1, 3), (1, 4)
- II. (0, 0), (1, 1), (2, 8), (3, 9)
- III. (0, 0), (3, 3), (2, 4), (1, 5)

- A. Only I
- B. Only II
- C. Only I and II
- D. Only II and III
- E. I, II, and III

17. Based on Ohm's law, the voltage V across two points is given by the rule $V = IR$, where I is the current through a conductor between two points and R is the resistance of the conductor. Make I the subject of the rule.

18. What is the value of $\frac{1}{2^{-3}}$

19. Solve $x + 4 = 3$

20. Which of the following is equal to $\frac{2^8}{2^6}$

21. What is the value of x when $2^{-4} \times 2^9 = 2^x$

22. Write $\frac{5}{8}$ as decimal

23. Evaluate 2^7

24. Find the slope of the line passing through A(1,2) and B(3,4)

25. Solve $2x + 1 = x - 3$



Solution:

- Let $C = \{9, x, e, 0\}$ and $D = \{8, 4, p, 0\}$.

$C \cap D$ = is the common elements
between set A and D
= $\{0\}$

Answer: 0

- Let $X = \{1, 5, 11, 13\}$ and $Y = \{2, 3, 5, 11\}$.

Answer: $X \cup Y = \{1, 5, 11, 13, 2, 3\}$

- Solve $-\frac{3}{4}q = -\frac{2}{3}$ and verify the answer.

$$q = \frac{-2}{3} \times \frac{-4}{3} = \frac{8}{9}$$

Check :

$$\frac{-3}{4} \times \frac{8}{9} = \frac{-2}{3}$$

Answer: $\frac{8}{9}$

- Solve the equation $8t - 6 = -2t + 14$ and verify your answer.

$$8t + 2t = 6 + 14$$

$$10t = 20$$

$$\frac{10t}{10} = \frac{20}{10}$$

$$t = 2$$

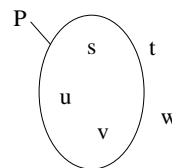
Check : *L.H.S* : $8t - 6 = 8(2) - 6 = 10$

R.H.S : $-2t + 14 = -2(2) + 14 = 10$

Answer: 2

Math exam for students entering Grade 09

- Consider the diagram below showing set P and other elements.



Which of the elements belong to set P?

Answer: $\{s, u, v\}$

- Write 756 as a product of distinct prime numbers, each raised to an exponent.

756	2
378	2
189	3
63	3
21	3
7	7
1	

Answer: $756 = 2^2 \times 3^3 \times 7$

- Represent 123×10^8 as scientific notation

$$123 \times 10^8 = 1.23 \times 10^{8+2} = 1.23 \times 10^{10}$$

Answer: 1.23×10^{10}

- What is the value of n if $(8^{-2})^{-4} = 8^n$?

$$(8^{-2})^{-4} = 8^n$$

$$8^{-2 \times -4} = 8^n$$

$$8^8 = 8^n$$

$$n = 8$$

Answer: 8



9. The table below displays values of two related variables x and y .

x	6	12	18	24	30
y	2	4	6	8	10

Which of the following equations describes the relationship between x and y ?

A. $y = 3x$

B. $y = 6x$

C. $y = \frac{x}{3}$

D. $y = \frac{x}{2}$

E. $y = x - 6$

$$\frac{x}{y} = \frac{6}{2} = \frac{12}{4} = \frac{18}{6} = \frac{24}{8} = \frac{30}{10} = 3$$

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

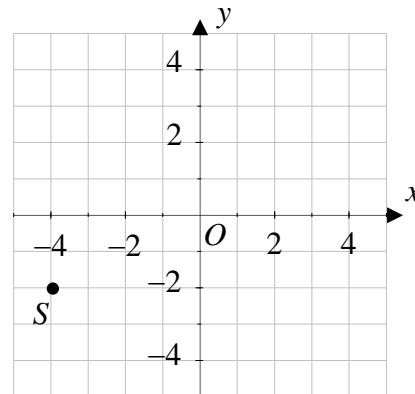
$$\frac{x}{y} = \frac{3}{1}$$

$$x = 3y (\div 3 \text{ both sides})$$

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

Answer: C

10. What are the coordinates of point S plotted on the coordinate plane below?



A. (2, 4)

B. (-4, 2)

C. (-4, -2)

D. (2, -4)

E. (-2, -4)

S has abscissa $x = -4$ and ordinate $y = -2$

$S(-4, -2)$

Answer: C

11. Which of the following is the graph of $y = -x + 3$?

Plot 2 points:

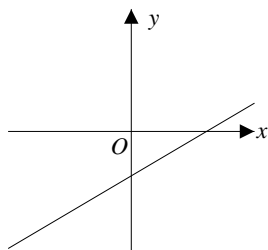
x	0	1
y	3	2

Points are: (0,3),(1,2)

Answer: A



12. Consider the line graphed below.



Which of the following is true about this line?

I. It has negative y-intercept (True since it cuts the y-axis from negative side)

II. It has negative slope.(false)

III. It has positive slope. (True since it is going up from left to right)

- A. Only I
- B. Only II
- C. Only III
- D. I and II
- E. I and III

Answer: E

13. Which of the following gives the x-intercept of the line $2x + 3y = 12$?

- A. (4, 0)
- B. (0, 4)
- C. (6, 0)
- D. (0, 6)
- E. (6, 4)

Solution:

$$\begin{aligned}x\text{-Intercept: } y &= 0 \\ 2x &= 12 \\ x &= 6\end{aligned}$$

(6,0)

Answer: C

14. Which of the following is true about lines l and m defined below?

$$l: y = 2x + 3$$

$$m: 2y - 4x = 5$$

- A. The two lines pass through the origin.(false since it is not of the form $y = kx$)
- B. The two lines are perpendicular.
- C. The two lines are parallel.
- D. The two lines are coincident.
- E. The two lines are intersecting.

Solution:

$$l: y = 2x + 3$$

$$m_1 = \text{slope} = 2 \quad \text{and } y\text{-intercept} = 3$$

$$m: 2y - 4x = 5 \quad 2y = 4x + 5 \quad \text{then } y = 2x + \frac{5}{2}$$

$$m_2 = \text{slope} = 2 \quad \text{and } y\text{-intercept} = \frac{5}{2}$$

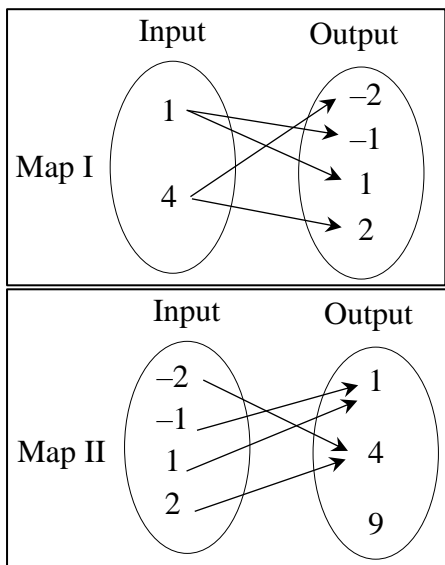
Since they have same slope but different y-intercept so they are parallel

Answer: C





15. The two maps below show the inputs and corresponding outputs of two number machines.



Which of the following is true?

- A. Only map I represents a function.
- B. Only map II represents a function.
- C. Both maps represent a function.
- D. Both maps represent a relation but not a function.
- E. None of the two maps represents a relation.

Solution: Map I: It is not a function since the Input 1 has 2 Outputs -1,1 and the Input 4 has 2 Outputs -2,2

Map II: It is a function since every Input has only one Output

Answer: B

16. Which of the following sets of ordered pairs defines a function?

- I. (1, 1), (1, 2), (1, 3), (1, 4) (not a function since $x=1$ has 2 out puts 1 and 2)
- II. (0, 0), (1, 1), (2, 8), (3, 9) (function)
- III. (0, 0), (3, 3), (2, 4), (1, 5) (function)

- A. Only I
- B. Only II
- C. Only I and II
- D. Only II and III
- E. I, II, and III

Answer: (D) : II,III

17. Based on Ohm's law, the voltage V across two points is given by the rule $V = IR$, where I is the current through a conductor between two points and R is the resistance of the conductor. Make I the subject of the rule.

Solution:

$$V=IR \text{ (Divide by R both sides)}$$

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

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

18. What is the value of $\frac{1}{2^{-3}}$

Answer: $2^3 = 8$

19. Solve $x + 4 = 3$

Answer: $x = 3 - 4 = -1$

20. Which of the following is equal to $\frac{2^8}{2^6}$

Answer: $2^{8-6} = 2^2 = 4$

21. What is the value of x when $2^{-4} \times 2^9 = 2^x$

**Answer: $-4 + 9 = x$
 $x = 5$**

22. Write $\frac{5}{8}$ as decimal

Answer: 0.625

23. Evaluate 2^7

Answer: $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$

24. Find the slope of the line passing through A(1,2) and B(3,4)

$$\text{slope} = \frac{4-2}{3-1} = \frac{2}{2} = 1$$

Answer: 1



25. Solve $2x + 1 = x - 3$

Solution: $2x - x = -3 - 1$
 $x = -4$

Answer: -4