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

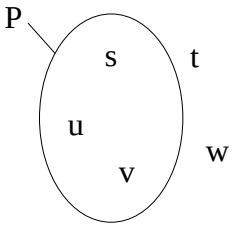
C ∩ **D** =

2. Let **X** = {1, 5, 11, 13} and **Y** = {2, 3, 5, 11}.
X ∪ **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 $\left(8^{-2}\right)^{-4} = 8^n$?

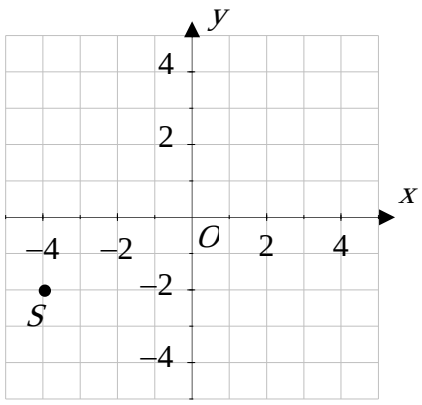
9. The table below displays values of two related variables *x* and *y*.

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. $y = x - 6$

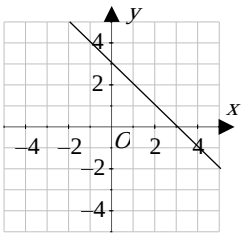
10. What are the coordinates of point *S* plotted on the coordinate plane below?



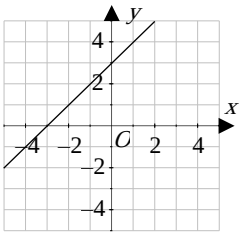
A. (2, 4)
B. (–4, 2)
C. (–4, –2)
D. (2, –4)
E. (–2, –4)

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

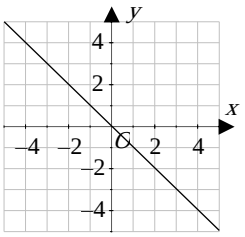
A.



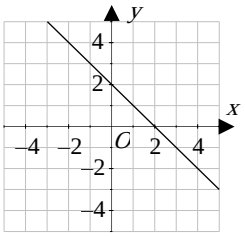
B.



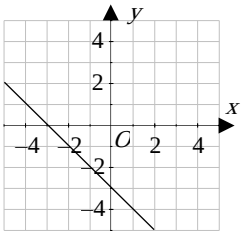
C.



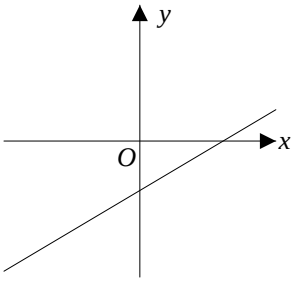
D.



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 $2x + 3y = 12$?

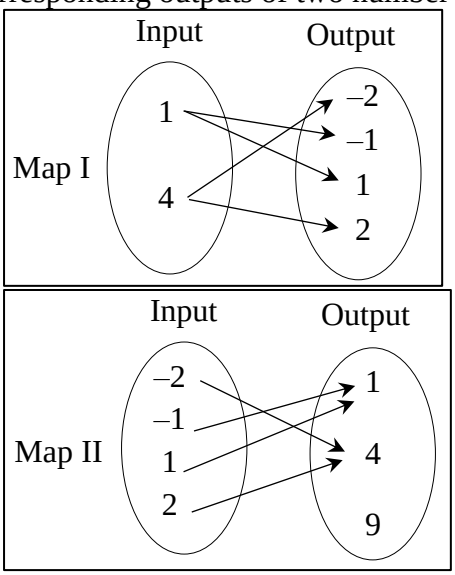
A. (4, 0)
B. (0, 4)
C. (6, 0)
D. (0, 6)
E. (6, 4)

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:

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

C ∩ **D** = is the common elements between set A and D

= {0}

Answer: 0

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

Answer: **X** ∪ **Y** = {1,5,11,13,2,3}

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: $\frac{8}{9}$

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

$8t+2t=6+14$

$10t=20$

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

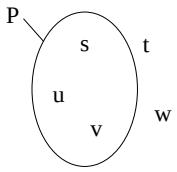
$t=2$

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

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

Answer: **2**

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



Which of the elements belong to set P?

Answer: p={s, u, v}

6. 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: $756=2^2.3^3.7$

7. Represent 123×10^8 as scientific notation

$123\times10^8=1.23\times10^{8+2}=1.23\times10^{10}$

Answer: 1.23×10^{10}

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

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

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

$8^8=8^n$

$n=8$

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. $y = x - 6$

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

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

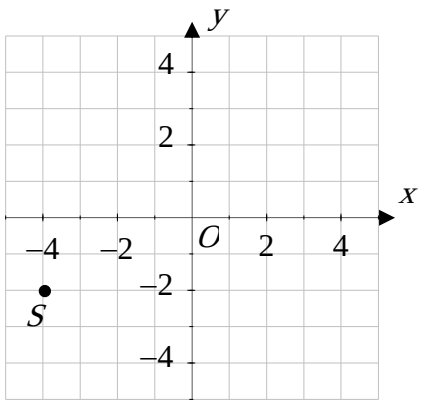
$$\frac{x}{y} = \frac{3}{1}$$

$$x = 3y\,(\div 3 both\ sides)$$

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

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 $y = -x + 3$?

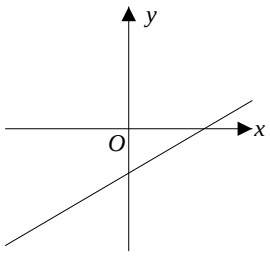
Plot 2 points:

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:

X-Intercept: y=0

$2x=12$

$x=6$

(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:

$l: y = 2x + 3$

m1=slope=2 and Y-intercept=3

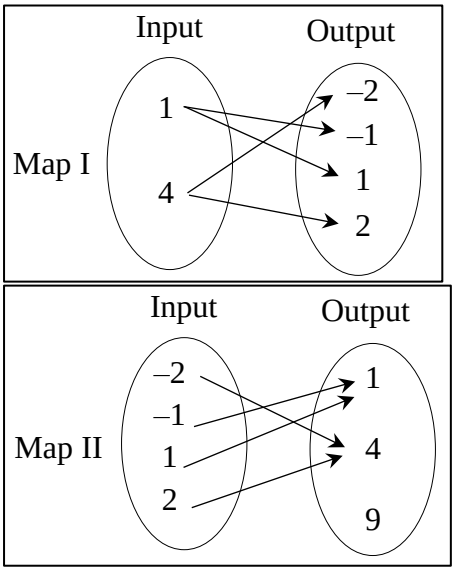
$m: 2y - 4x = 5$ $2y=4x+5$ then $y=2x+\frac{5}{2}$

m2=slope=2 and Y-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 (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; 2.2.2.2.2.2.2=128

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

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

Answer: 1

25. Solve 2x+1=x-3

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