



MATHS

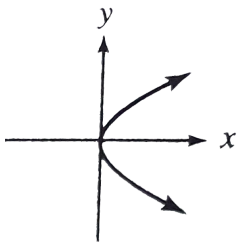
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MATHS (ENGLISH)

HEART OF ALGEBRA

Example

1. What does this graph not represent a function ?



A.

B. 

C. 

D. 

Answer: A



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2. if $f(x) = x^2 + 3$ and $g(x) = x - 5$, evaluate $f(g(9))$.

A. 4

B. 19

C. 79

D. 81

Answer: B



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3. If $f(x) = \frac{ax}{b}$ and $g(x) = \frac{cx^2}{a}$, then $g(f(a))$ equals

A. $\frac{a^2}{b}$

B. $\frac{a^2c}{b}$

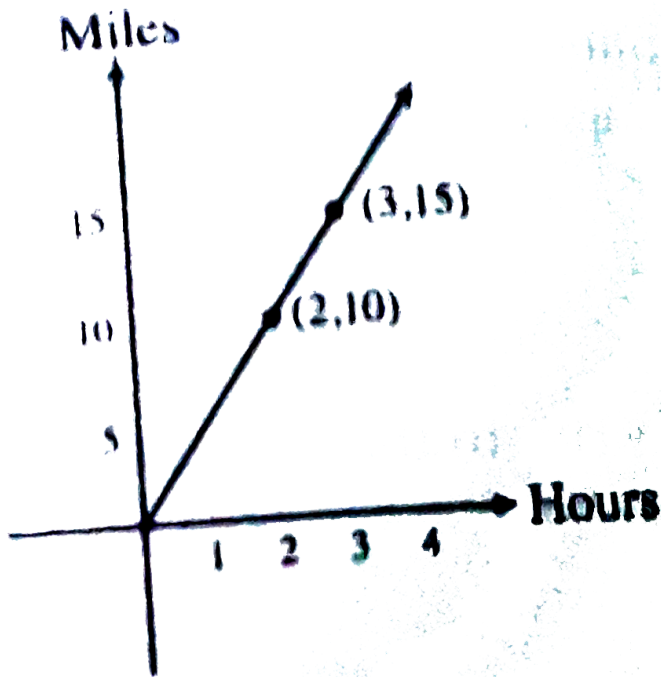
C. $\frac{a^2c}{b^2}$

D. $\frac{ca^3}{b^2}$

Answer: D



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4.

A cyclist maintains a constant speed on his bicycle . The graph above shows the number of miles he covers in x hours . Two points on the graph are $(2,10)$ and $(3,15)$. What is the cyclist's speed in miles per hour ?

A. 1

B. 5

C. 10

D. 15

Answer: B



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5. The slope of the line with equation $2x-2y=7$

is

A. -1

B. 1

C. -2

D. 2

Answer: B



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6. What is the y-intercept of the line through points $(3,-2)$ and $(-1,6)$?



7. A line containing point $(2,4)$ has slope 3. If point P lies on this line , which of the following could be point P ?

A. $(3,7)$

B. $(2,6)$

C. $(2,7)$

D. $(3,-1)$

Answer: A





8. What value of k will make the line containing points $(k,3)$ and $(-2,1)$ perpendicular to the line containing $(5,k)$ and $(1,0)$?

A. -4

B. $-\frac{4}{3}$

C. -1

D. $-\frac{3}{4}$

Answer: B



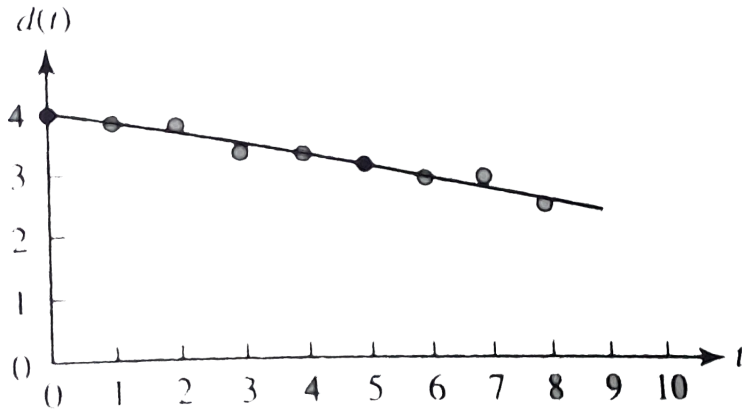
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9. The table of values shown is for some linear function $f(x)$. Find $f(10)$.

| x | y |
|-----|-----|
| -2 | -11 |
| -1 | -7 |
| 0 | -3 |
| 1 | 1 |



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10.

Joe bikes 4 kilometers to school . Because of the traffic and road conditions along the way , his speed varies. The dots on the graph above show his distance from the school at various times , starting at home at $t=0$ (black dot). After 5 minutes Joe is 3.2 kilometers from the school (second black dot). The data show that

his speed is almost constant , and his distance from the school can be approximated by a straight line . The graph of the function that models Joe's distance from school as a function of time , in minutes , is shown as a solid line. Which of the following equations best represents this function ?

A. $d(t) = -0.5t + 4$

B. $d(t) = -0.16t + 4$

C. $d(t) = -6.25t + 4$

D. $d(t) = 0.16t + 4$

Answer: B



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11. Jonah rented a car for two days and his bill came to \$108.00 . The rental company charged \$30 a day and 15¢ for each mile driven. If x is the number of miles that Jonah drove , which equation correctly determines x ?

A. $30x+15(2)=108$

B. $0.15x+30(2)=108$

C. $15x+30(2)=108$

D. $15x+30(2)=10,800$

Answer: B



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12. The gas mileage for Jan's car is 28 miles per gallon when the car travels at an average speed of 55 miles per hour. The car's gas tank has 20 gallons of gas at the beginning of a trip. If Jan drives at an average speed of 55

miles per hour, Which of the following functions f models the number of gallons of gas remaining in the tank t hours after the trip begins ?

A. $f(t) = 20 - \frac{28}{55}t$

B. $f(t) = \frac{20 - 55t}{28}$

C. $f(t) = \frac{20 - 28t}{55}$

D. $f(t) = 20 - \frac{55t}{28}$

Answer: D



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13. The graphs of $y=2x-5$ and $x + 3y=-1$ intersect at

A. $(-1,2)$

B. $(-2,-1)$

C. $(2,-1)$

D. $(-2,1)$

Answer: C



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14. $15x + 5y = -8$

$y + 4 = -3x$

How many solutions does the system above have ?

A. 0

B. 1

C. 2

D. An infinite number

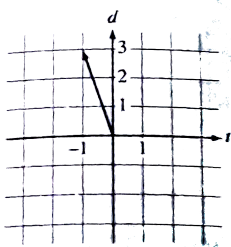
Answer: A



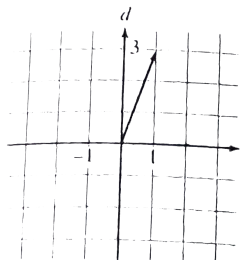
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Practice Test

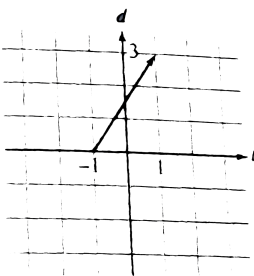
1. The distance d , in miles, that an object travels at a uniform speed is directly proportional to the number of hours t it travels. If the object travels 6 miles in 2 hours, which could be the graph of the relationship between d and t ?



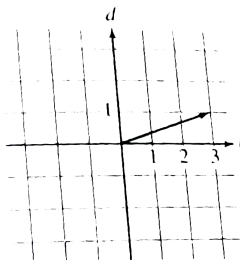
A.



B.



C.

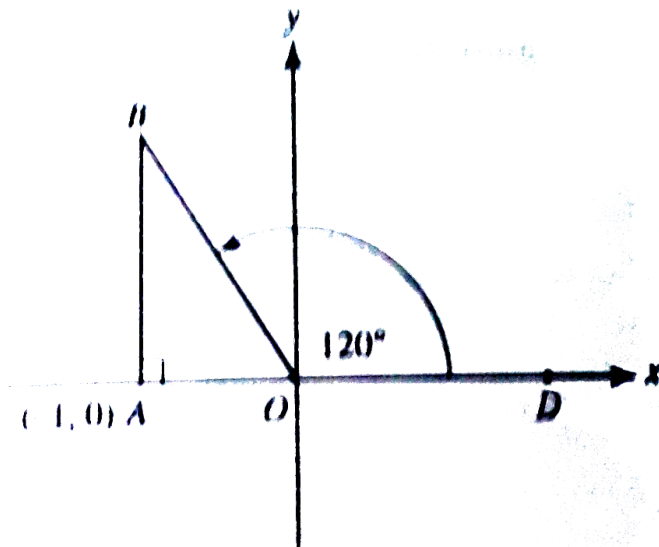


D.

Answer: B



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2.

In the diagram above, A and D are points on the x-axis. Point A has coordinates $(-1, 0)$, and $\angle BOD$ measures 120° . What is the slope of line \overline{BO} ?

A. $\sqrt{3}$

B. $\frac{\sqrt{3}}{2}$

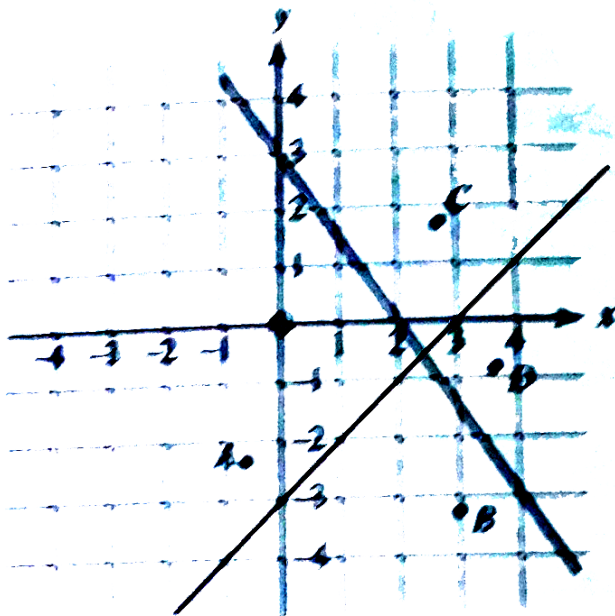
C. $\frac{\sqrt{3}}{-2}$

D. $-\sqrt{3}$

Answer: D



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3.

The lines shown in the above diagram have equations $x-y=3$ and $3x+2y=6$. Of the five labeled points, A-D, which one is in the solution set of the following system of

inequalities ?

$$x - y \leq 3 \text{ and } 3x + 2y \leq 6$$

A. A

B. B

C. C

D. D

Answer: A



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4. Carol downloads x songs at 99 cents each , and y e-books at \$2.99 each. Altogether she buys 11 items , where an item is a song or an e-book . The total amount of money she spends on this transaction is \$22.89 . Solving which of the following equations correctly yields y , the number of e-books ?

A. $0.99(11-y)+2.99y=22.89$

B. $0.99(11+y) + 2.99y = 22.89$

C. $2.99(11-y)+0.99 y = 22.89$

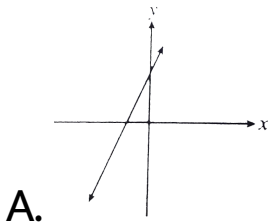
$$D. 2.99(11+y) + 0.99y = 22.89$$

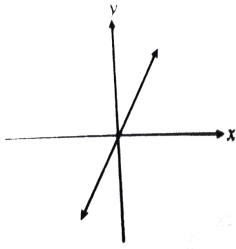
Answer: A



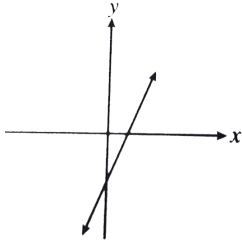
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5. If k is a positive constant such that $0 < k < 1$, which of the following could be the graph of $y - x = k(x + y)$?

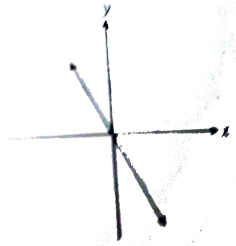




B.



C.



D.

Answer: B



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6. $\frac{1}{2}x - \frac{1}{4}y = 5, ax - 3y = 20$

In the system of linear equations above, a is a constant . If the system has no solutions , what is the value of a ?

A. 6

B. 2

C. $\frac{1}{3}$

D. -2

Answer: A



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$$7. 3x+2y=6$$

$$y-2x=24$$

Based on the system of equations above ,
what is the value of the quotient $\frac{x}{y}$?

A. 2

B. $\frac{1}{2}$

C. $-\frac{1}{2}$

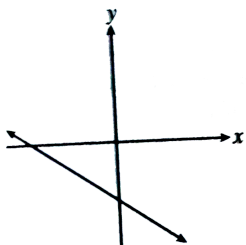
D. -2

Answer: C

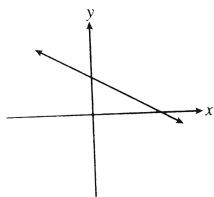


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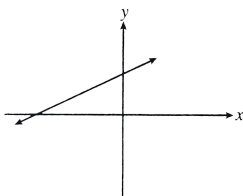
8. Which of the following could be the graph of $2x+3y+12=0$?



A.

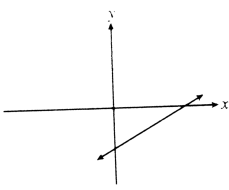


B.



C.

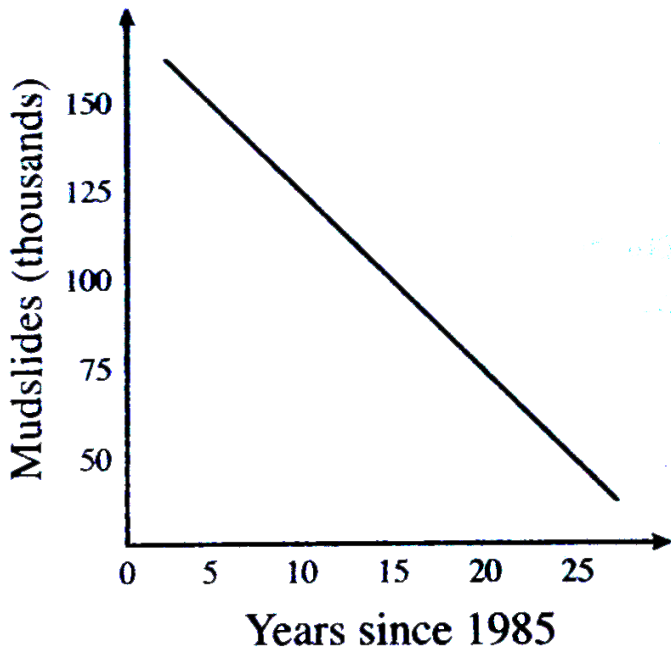
D.



Answer: A



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9.

The number of mudslides in a certain country for the past 25 years is approximated by the graph shown above . The graph displays the number of mudslides (in thousands) from 1985 to 2010. Based on the graph , which of the

following is closest to the average yearly decrease in the number of mudslides ?

A. 1

B. 5

C. 10

D. 25

Answer: B



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10. Tickets to a show are \$150 each plus 8 percent sales tax. There is also a \$6 processing fee for each transaction. Which of the following represents the total charge, in dollars, for one-time purchase of x tickets?

A. $0.08(150x)+6$

B. $1.08(150x)+6$

C. $0.08(150x+6)$

D. $1.08(150x+6)$

Answer: B



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11.
$$\frac{2(p + 3) - 7}{4} = \frac{16 - 2(3 - p)}{6}$$

In the equation above, what is the value of p ?



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12. If $\frac{1}{5}x - \frac{2}{3}y = 4$. What is the value of $3x - 10y$?



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13. If $-\frac{9}{5} < -5t + 2 < -\frac{7}{4}$. What is one possible value of $10t-4$?



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14. The graph of $3x-4y=5$ is perpendicular to the graph of $2x+ky-10=0$. Find k .



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