June 2014 (no stats)

Name: _____ **Date:** _____

1. When solving the equation $4\left(3x^2+2\right)-9=8x^2+7$, Emily wrote $4\left(3x^2+2\right)=8x^2+16$ as her first step. Which property justifies Emily's first step?

   A. addition property of equality

   B. commutative property of addition

   C. multiplication property of equality

   D. distributive property of multiplication over addition

2. Officials in a town use a function, C, to analyze traffic patterns. $C(n)$ represents the rate of traffic through an intersection where n is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?

   A. $\{\ldots -2,-1,0,1,2,3,\ldots\}$

   B. $\{-2,-1,0,1,2,3\}$

   C. $\left\{0,\frac{1}{2},1,1\frac{1}{2},2,2\frac{1}{2}\right\}$

   D. $\{0,1,2,3,\ldots\}$

3. If $A=3x^2+5x-6$ and $B=-2x^2-6x+7$, then $A-B$ equals

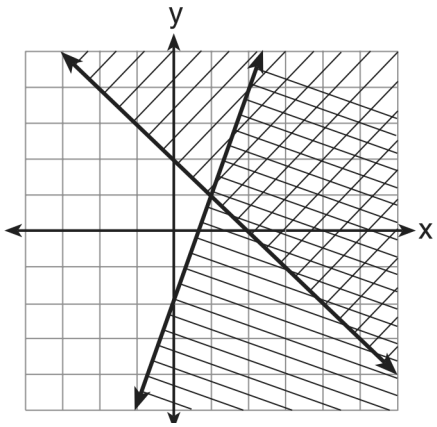
   A. $-5x^2-11x+13$ B. $5x^2+11x-13$

   C. $-5x^2-x+1$ D. $5x^2-x+1$

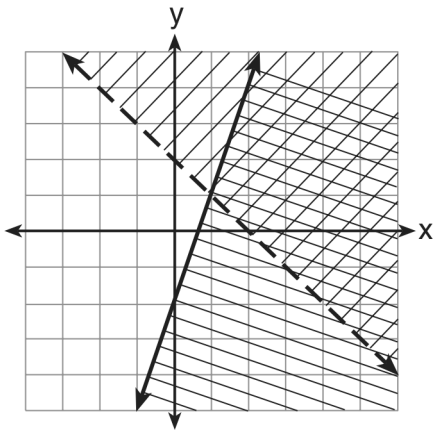
4. Given: $y + x > 2$
$y \leq 3x - 2$

Which graph shows the solution of the given set of inequalities?

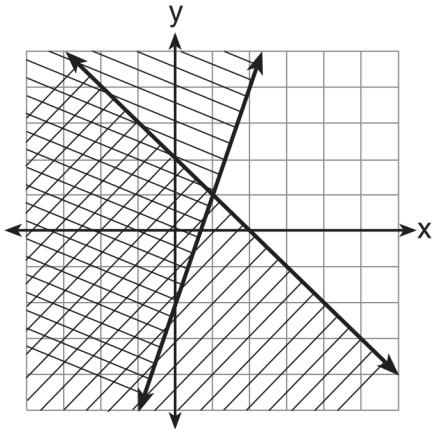
A.



B.



C.



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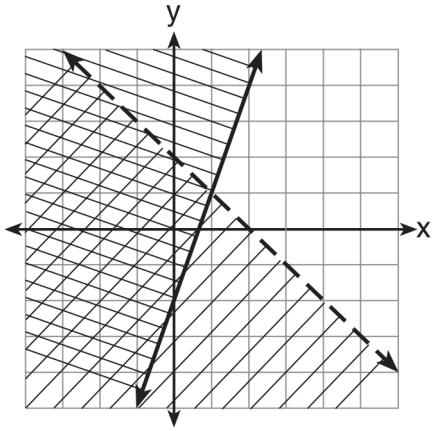


5. Which value of x satisfies the equation $\frac{7}{3}\left(x + \frac{9}{28}\right) = 20$?

A. 8.25 B. 8.89 C. 19.25 D. 44.92

6. The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

Year	Balance, in Dollars
0	380.00
10	380.00
20	562.49
30	1232.49
40	1824.39
50	2700.54

Which type of function best models the given data?

A. linear function with a negative rate of change

B. linear function with a positive rate of change

C. exponential decay function

D. exponential growth function

7. A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

A. the start-up cost

B. the profit earned from the sale of one radio

C. the amount spent to manufacture each radio

D. the average number of radios manufactured

8. Which equation has the same solution as $x^2 - 6x - 12 = 0$?

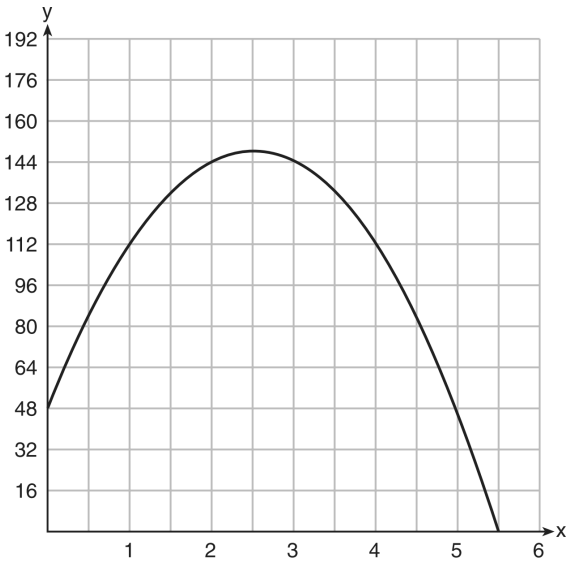
A. $(x + 3)^2 = 21$

B. $(x - 3)^2 = 21$

C. $(x + 3)^2 = 3$

D. $(x - 3)^2 = 3$

9. A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y, of the ball from the ground after x seconds.



For which interval is the ball's height always *decreasing*?

A. $0 \leq x \leq 2.5$

B. $0 < x < 5.5$

C. $2.5 < x < 5.5$

D. $x \geq 2$

10. What are the roots of the equation $x^2 + 4x - 16 = 0$?

A. $2 \pm 2\sqrt{5}$

B. $-2 \pm 2\sqrt{5}$

C. $2 \pm 4\sqrt{5}$

D. $-2 \pm 4\sqrt{5}$

11. Keith determines the zeros of the function $f(x)$ to be -6 and 5. What could be Keith's function?

A. $f(x) = (x + 5)(x + 6)$

B. $f(x) = (x + 5)(x - 6)$

C. $f(x) = (x - 5)(x + 6)$

D. $f(x) = (x - 5)(x - 6)$

12. Given:

$L = \sqrt{2}$
$M = 3\sqrt{3}$
$N = \sqrt{16}$
$P = \sqrt{9}$

Which expression results in a rational number?

A. $L + M$

B. $M + N$

C. $N + P$

D. $P + L$

13. Which system of equations has the same solution as the system below?

$$2x + 2y = 16$$
$$3x - y = 4$$

A. $2x + 2y = 16$
$6x - 2y = 4$

B. $2x + 2y = 16$
$6x - 2y = 8$

C. $x + y = 16$
$3x - y = 4$

D. $6x + 6y = 48$
$6x + 2y = 8$

14. The table below represents the function F.

x	3	4	6	7	8
$F(x)$	9	17	65	129	257

The equation that represents this function is

A. $F(x) = 3^x$

B. $F(x) = 3x$

C. $F(x) = 2^x + 1$

D. $F(x) = 2x + 3$

15. John has four more nickels than dimes in his pocket, for a total of \$1.25. Which equation could be used to determine the number of dimes, x, in his pocket?

A. $0.10(x + 4) + 0.05(x) = \$1.25$

B. $0.05(x + 4) + 0.10(x) = \$1.25$

C. $0.10(4x) + 0.05(x) = \$1.25$

D. $0.05(4x) + 0.10(x) = \$1.25$

16. If $f(x) = \frac{1}{3}x + 9$, which statement is always true?

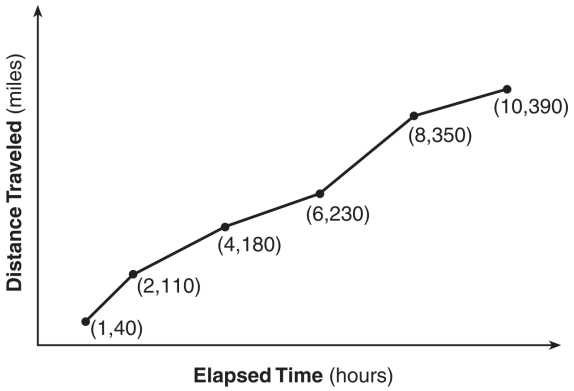
A. $f(x) < 0$

B. $f(x) > 0$

C. If $x < 0$, then $f(x) < 0$.

D. If $x > 0$, then $f(x) > 0$.

17. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.



During which interval was their average speed the greatest?

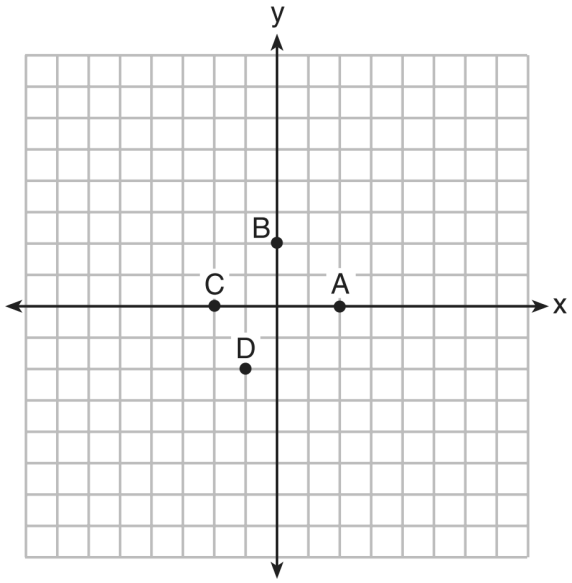
A. the first hour to the second hour

B. the second hour to the fourth hour

C. the sixth hour to the eighth hour

D. the eighth hour to the tenth hour

18. The graph of $y = f(x)$ is shown below.



Which point could be used to find $f(2)$?

A. *A* B. *B* C. *C* D. *D*

19. A cell phone company charges \$60.00 a month for up to 1 gigabyte of data. The cost of additional data is \$0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

A. $c = 60 - 0.05d$ B. $c = 60.05d$

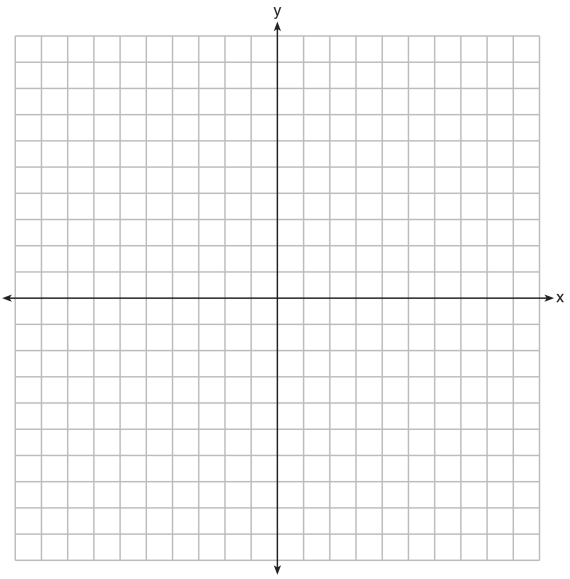
C. $c = 60d - 0.05$ D. $c = 60 + 0.05d$

20. The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. The radius, r, of the cone may be expressed as

A. $\sqrt{\frac{3V}{\pi h}}$ B. $\sqrt{\frac{V}{3\pi h}}$

C. $3\sqrt{\frac{V}{\pi h}}$ D. $\frac{1}{3}\sqrt{\frac{V}{\pi h}}$

21. Draw the graph of $y = \sqrt{x} - 1$ on the set of axes below.



22. The breakdown of a sample of a chemical compound is represented by the function $p(t) = 300(0.5)^t$, where $p(t)$ represents the number of milligrams of the substance and t represents the time, in years. In the function $p(t)$, explain what 0.5 and 300 represent.