Algebra I
Unit 2 Reasoning with Linear Equations and Inequalities
Post Test

1. A family's cell phone plan costs \$70 per month for 1,300 minutes and 40 cents per minute over the limit. This month, the family paid \$118.40. By how much time did they exceed their plan?

a. 121 minutes
b. 471 minutes
c. 20 minutes
d. 76 minutes

2. You have no more than \$60 to spend. You want a drink that costs \$1.50 including tax, and you want to buy a pair of pants, which will have 4% sales tax. What is the inequality that represents the amount of money you have to spend?

a. $x + 0.04x + 1.50 > 60$
b. $x + 0.04x + 1.50 \geq 60$
c. $x + 0.04x + 1.50 < 60$
d. $x + 0.04x + 1.50 \leq 60$

3. The formula for calculating a person's body mass index is $B = \frac{w}{h^2}$, for which w represents weight in kilograms and h represents height in meters. Solve this formula for w.

a. $w = Bh^2$
b. $w = B - h^2$
c. $w = \frac{B}{h^2}$
d. $w = (Bh)^2$

4. The recursive formula for an arithmetic sequence is given as $a_n = a_{n-1} + 12$, with $a_1 = 9$. What are the first four terms of the sequence?

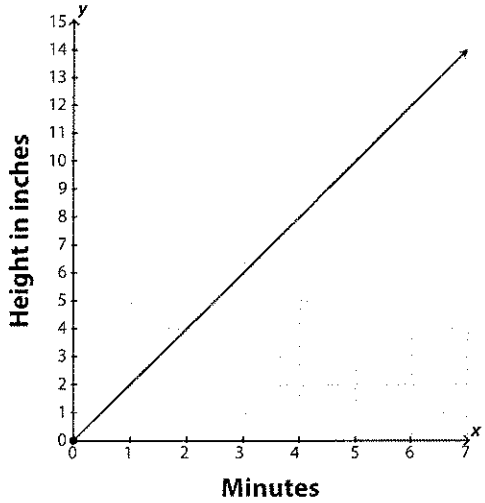
a. 12, 21, 30, 39
b. 9, 21, 33, 45
c. 9, 84, 1008, 12,096
d. 1, 12, 144, 1728

5. It costs \$80 to buy an air conditioner and about \$0.40 per minute to run it. Which equation models the total cost of using an air conditioner?

a. $x + y = 80.40$
b. $y = 80.40x$
c. $y = 80x + 0.40$
d. $y = 0.40x + 80$

6. A 12-inch candle burns at a rate of 2 inches per hour. What is the graph of the equation that models the height of the candle over time?

a.



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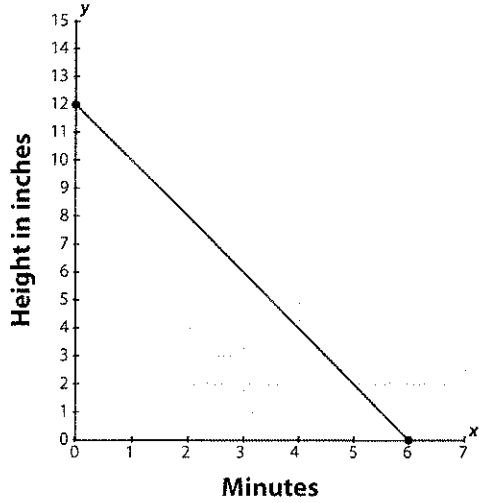

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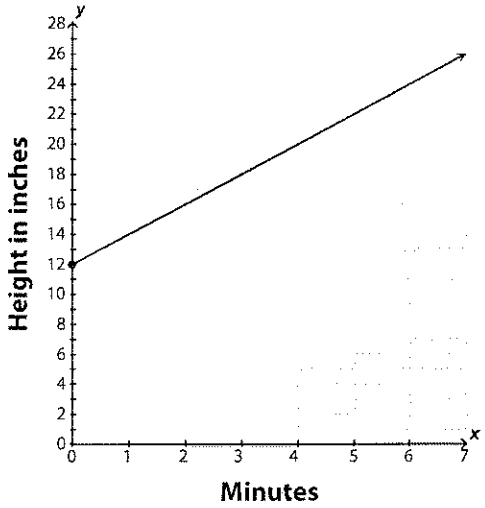

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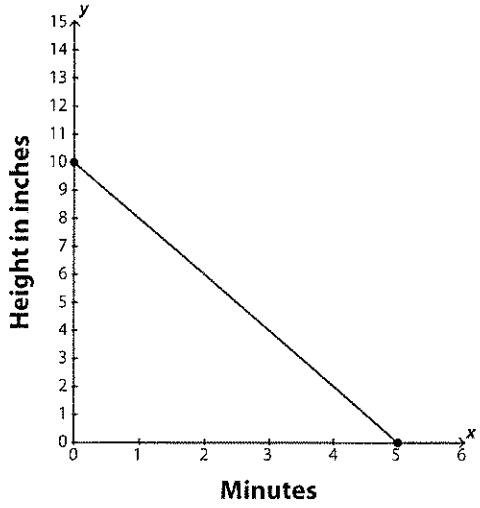


7. Given the inequality $y \leq -3x + 6$, which point is NOT a solution?

a. $(1, -3)$

b. $(0, -2)$

c. $(-1, -9)$

d. $(2, 3)$

8. Your cell phone company charges \$29.99 a month plus \$0.25 for each text message sent. You have budgeted no more than \$35.00 for cell phone service each month. Given this situation, determine the minimum and maximum number of texts you can send without going over budget. Let x represent the number of texts.

a. $x < 20.04$

b. $x \geq 0$ and $x \leq 20.04$

c. $x > 0$ and $x < 20$

d. $x \geq 0$ and $x \leq 20$

9. Identify the property of equality that justifies the missing step in solving the equation below.

Equation	Steps
$23 = 2x - 9$	Original equation
$32 = 2x$	
$16 = x$	Division property of equality
$x = 16$	Symmetric property of equality

a. subtraction property of equality
b. addition property of equality
c. division property of equality
d. multiplication property of equality

10. What is the solution to the inequality $\frac{4x}{5} + 3 > x + 5$?

a. $x > 10$
b. $x < 10$
c. $x > -10$
d. $x < -10$

11. What is the solution to the equation $3x + 5(4x - 6) - 8 = 3x - 14$?

a. $x = 1$
b. $x = 1.7$
c. $x = 1.2$
d. There are no solutions to this equation.

12. Tickets to the carnival cost \$9.00 for adults and \$7.50 for children. A group of 11 people went to the carnival and paid \$87 for tickets. How many adult tickets were purchased? How many children's tickets were purchased?

a. 3 adult tickets and 8 children's tickets were purchased.
b. 8 adult tickets and 3 children's tickets were purchased.
c. 5 adult tickets and 6 children's tickets were purchased.
d. The number of each ticket purchased can't be determined from the given information.

13. The explicit formula for an arithmetic sequence is given as $a_n = x + (n-1)(4)$. The fifth term of the sequence is –27. What is the missing value?

a. –43
b. 43
c. –11
d. 11

14. What is the solution to the system $\begin{cases} 4x-6y=42 \\ x+6y=48 \end{cases}$?

a. (5, 18)

b. (18, 5)

c. There are infinitely many solutions to this system of equations.

d. There are no solutions to this system of equations.

15. Which of the following is true at the intersection of $y = f(x)$ and $y = g(x)$?

a. $f(x) = g(x)$

b. $x = 0$

c. $f(x) = 0$

d. $g(x) < f(x)$

16. If $f(x) = 3x - 5$ and the domain of f is {2, 4, 6}, what is the range of $f(x)$?

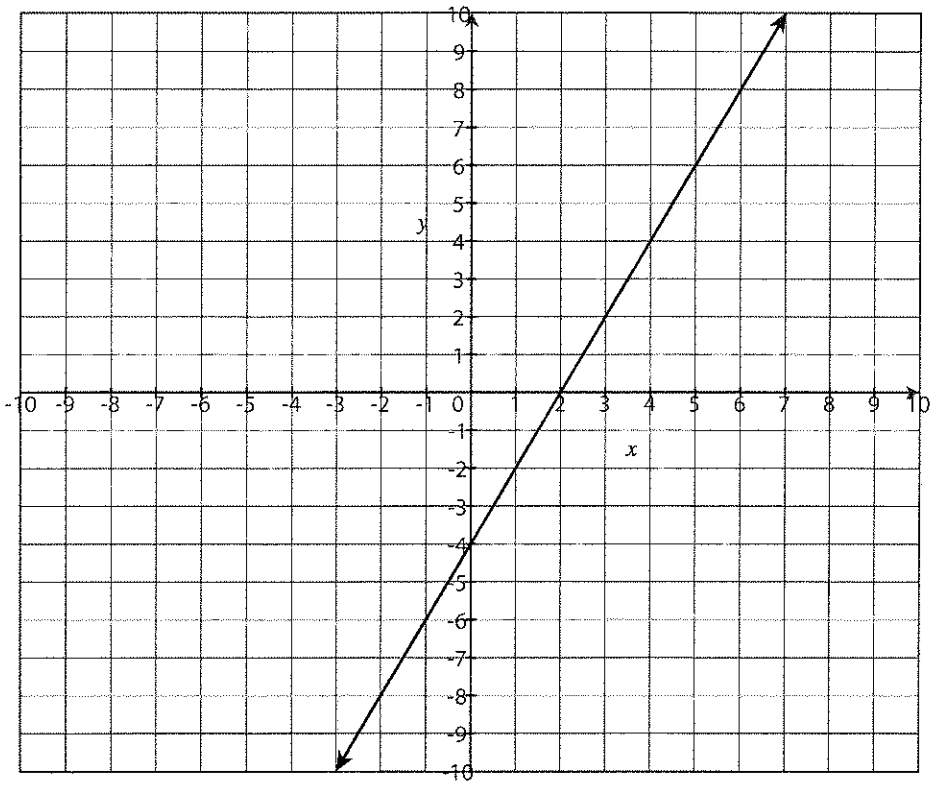
a. {11, 17, 20}

b. {–6, –4, –2}

c. {2, 4, 6}

d. {1, 7, 13}

17. Given the graph below, what is $f(6)$?



a. $f(6) = 5$

b. $f(6) = 8$

c. $f(6) = -4$

d. $f(6) = 0$

18. How does increasing the slope in a linear function change the graph of the line?

a. The line rises more steeply.

b. The line is less steep.

c. The y-intercept increases.

d. The y-intercept decreases.

19. Your car broke down, and the final bill was \$261.50. The part that was replaced cost \$99, and the charge for the mechanic's labor is \$65 per hour. Write an equation to model this situation, then solve the equation for the number of hours the mechanic worked on your car.

20. A photographer sells large photos for a \$27 profit and small photos for an \$11 profit. This past year, she sold 126 photos and made a profit of \$2,250. How many of each size photo did she sell?