TEST NAME: **NAMSIM11314A-CED.2**
TEST ID: **134987**
GRADE: **09**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: ______________________

Class: ______________________

Date: ______________________

1. Andrew purchased a car for $19,500. The value of the car depreciates at a rate of 8.6% each year. Which equation models the value of Andrew's car, *y*, after *x* years?

A. $y = 19{,}500(1.914)^x$

B. $y = 19{,}500(1.086)^x$

C. $y = 19{,}500(0.914)^x$

D. $y = 19{,}500(0.086)^x$

2. Mary has written 10 pages for her novel. She plans to write 15 additional pages per month until she is finished. Which equation represents the total number of pages Mary has written, *p*, after *m* months?

A. $p = 10m + 15$

B. $p = 10m - 15$

C. $p = 15m + 10$

D. $p = 15m - 10$

3. John has a full tank of gas in his car.

- His car has a 15-gallon tank.
- His car gets 30 miles per gallon.

Which equation shows the relationship between how many miles, *m*, John drives and the number of gallons of gas, *g*, remaining in the car's tank?

A. $g = 15 - 30m$

B. $m = 30g - 15$

C. $g = 15 - \frac{m}{30}$

D. $m = \frac{30}{g} - 15$

4. An ice cream shop charges $1 for a cone and $2 per scoop of ice cream. Which equation models the cost of an ice cream cone, $y$, with $x$ scoops of ice cream?

A. $1 = 2x + y$

B. $2 = x + y$

C. $y = x + 2$

D. $y = 2x + 1$

5. Mikel has $20 to spend at the aquarium.

- The aquarium charges a $10 admission fee.
- The aquarium also has special exhibits that cost $4.00 each to view.

Which equation can be used to determine the amount of money, $y$, that Mikel has left if he views $x$exhibits?

A. $y = 4 - 10x$

B. $y = 10x - 4$

C. $y = 10 - 4x$

D. $y = 4x - 10$

6. Sandra's cell phone plan gives her unlimited minutes for $15.50 per month. She is charged $0.08 for each text message, $t$. Which equation models the total monthly cost, $C$, for the cell phone?

A. $C = 15.50t + 0.08$

B. $C = 0.08t + 15.50$

C. $C = 15.58t$

D. $C = 15.42t$

7. In 6 years, Susan's age, *y*, will be half as much as her sister's age, *x*, will be in two years. Which equation models Susan's age in terms of her sister's age?

A. $y = \frac{1}{2}x - 5$

B. $y = \frac{1}{2}x - 4$

C. $y = \frac{1}{2}x + 1$

D. $y = \frac{1}{2}x + 4$

8. There were 36 students absent from a school on Tuesday.

- 3% of the boys were absent.
- 7% of the girls were absent.

Which equation models the total number of boys, *x*, at the school in terms of the total number of girls, *y*, at the school?

A. $y = \frac{10 - 3x}{7}$

B. $y = \frac{36 - 3x}{7}$

C. $y = \frac{1,000 - 3x}{7}$

D. $y = \frac{3,600 - 3x}{7}$

9. Jane invested $755 in an account that earns interest at a rate of 8.5%, compounded annually. Which equation can be used to determine the value, *v* (in dollars), of Jane's investment after *t* years?

A. $v = 755 + 1.085t$

B. $v = 755(1.085t)$

C. $v = 755(1.085)^t$

D. $v = [755(1.850)]^t$

10. Kaitlyn is mowing her lawn. The lawn has an area of 5,625 square feet. She can mow about 75 square feet each minute. Which equation represents the amount of lawn, $y$, that Kaitlyn still has left to mow after $x$ minutes?

A. $y = 5{,}625 + 75x$

B. $y = 5{,}625 - 75x$

C. $y = 5{,}625(x - 75)$

D. $y = 5{,}625(75 - x)$

11. The width of a rectangle is 3 more than its length. The dimensions of a second rectangle are 25% of the dimensions of the first rectangle. Which equation can be used to determine the area of the second rectangle, $A$, in terms of the length, $l$, of the first rectangle?

A. $A = 0.0625l^2 + 0.1875l$

B. $A = 0.25l^2 + 0.75l$

C. $A = 0.5l^2 + 1.5l$

D. $A = l^2 + 3l$

12. A colony of bacteria grows at a rate of 8% every 2 hours. The colony began with 100 bacteria. Which equation can be used to determine the number of bacteria, $B$, in the colony after $t$ hours?

A. $B = 0.08t + 100$

B. $B = 0.04t + 100$

C. $B = 100(1.08)^t$

D. $B = 100(1.08)^{\frac{t}{2}}$

13. A business buys a computer for $3,000. After 4 years, the value of the computer is expected to be $250. The value, $V$, can be related to the time in years, $t$, in a linear equation. Which equation models the relationship between $V$ and $t$?

A. $V = 250t$

B. $V = 12t$

C. $V = 687.50t - 3{,}000$

D. $V = {}^{-}687.50t + 3{,}000$

14. A cell phone plan costs $49 per month for 200 minutes. For each minute over 200, the customer is charged an additional $0.10 per minute. Which equation could be used to calculate the monthly bill, $y$, if a person talked $x$ minutes over 200 in a month?

A. $y = 0.1x + 49$

B. $y = 0.1x + 249$

C. $y = 0.1(200 - x) + 49$

D. $y = 0.1(x - 200) + 49$

15. Nicholas borrowed $250 from his parents to buy a video game system. He has agreed to pay them back $15 each week. Which equation represents the amount of money Nicholas still owes his parents, $p$, after $w$ weeks?

A. $p = 250w - 15$

B. $p = 15w - 250$

C. $p = {}^{-}15w + 250$

D. $p = 15(w - 250)$

16. Suppose a forest starts with a deer population of 35 deer. The population is increasing at a rate of 12% per year. Which equation represents the population of deer after $x$ years?

A. $y = 12(0.35)^x$

B. $y = 12(1.35)^x$

C. $y = 35(0.12)^x$

D. $y = 35(1.12)^x$

17. Scientists measure the total population of sea turtles, $y$, each year in a refuge. They discovered an initial population of 65 sea turtles and an increase of 5 turtles each year. If $x$ is the number of years after the initial observation, which equation ***best*** models the sea turtle population?

A. $y = 5x + 65$

B. $y = 5(65)^x$

C. $y = 65x + 5$

D. $y = 65(5)^x$

18. The value of a computer has decreased by 23% each year since it was purchased. The computer was valued at $1,500 when it was purchased. Which equation models the value of the computer, $V$, $t$ years after it was purchased?

A. $V = 0.77(1{,}500)^t$

B. $V = 1.23(1{,}500)^t$

C. $V = 1{,}500(0.77)^t$

D. $V = 1{,}500(1.23)^t$

19. Adam purchased a baseball card for $0.75.

- The value of the card at the time he purchased it was 5% less than the price he paid for the card.
- The value of the card has increased by $0.83 every year since he purchased the card.

Which equation models the value, $v$, of the card $t$years after Adam purchased the card?

A. $v = 0.83t + 0.71$

B. $v = 0.83t + 0.75$

C. $v = 0.75t + 0.83$

D. $v = 0.71t + 0.83$

20. A rabbit weighed 4 ounces when it was born. The rabbit gained 2 ounces each week for the next 12 weeks. Which equation models the weight of the rabbit, $w$, $x$ weeks after it was born, where $x \leq 12$?

A. $w = 6x$

B. $w = 2x - 4$

C. $w = 2x + 4$

D. $w = 4x + 2$

21. The number of bacteria, $y$, in a certain area doubles every hour, $x$. Which function could be used to model this situation?

A. $y = x + 2$

B. $y = x^2$

C. $y = 2x$

D. $y = 2^x$

22. Mr. Frank bought a car that cost $33,000 dollars. The car depreciates approximately 12% of its value each year. Which equation represents the value, $v$, of the car after $t$ years?

A. $t = 33{,}000(0.12)^v$

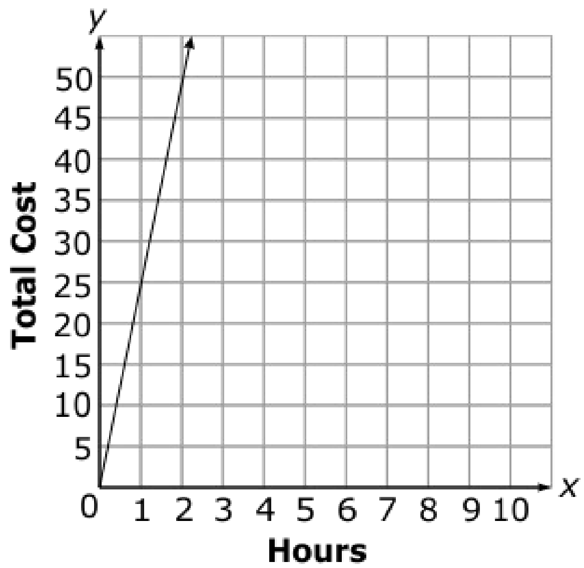
B. $v = 33{,}000(0.12)^t$

C. $t = 33{,}000(0.88)^v$

D. $v = 33{,}000(0.88)^t$

23. Mrs. Baker charges an initial fee of $20 to clean a house. She charges an additional $5 for each hour it takes her to clean the house. Which graph shows the total cost, $y$, that Mrs. Baker charges if she spends $x$ hours cleaning a house?

A.


y
50
45
40
35
30
25
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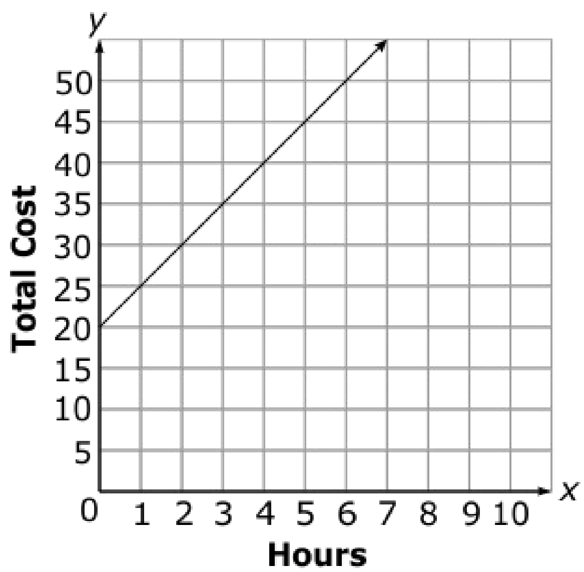
15
10
5
0
Total Cost
x
1 2 3 4 5 6 7 8 9 10
Hours

B.


y
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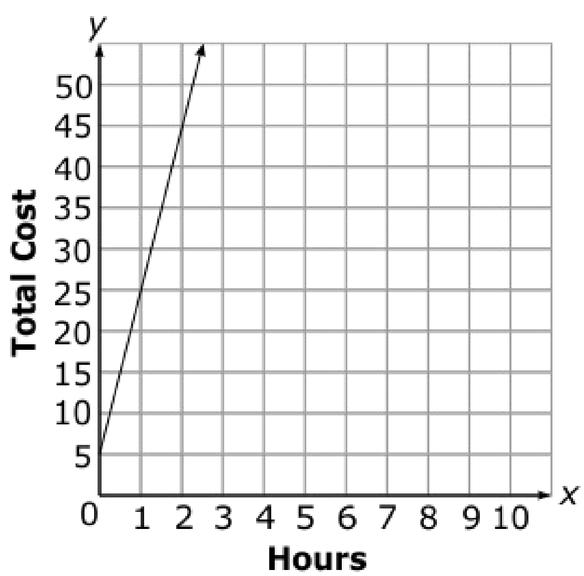
1 2 3 4 5 6 7 8 9 10
Hours

C.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Total Cost
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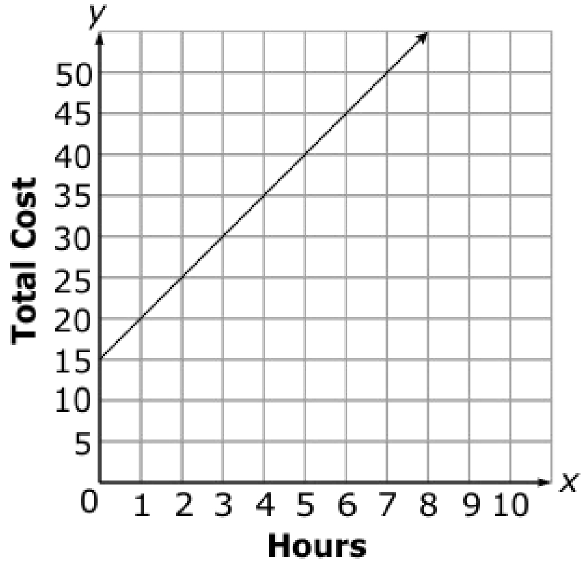
1 2 3 4 5 6 7 8 9 10
Hours

D.




24. The population in a city was 13,400 in 2010. Research indicates that the population is growing at a rate of 4.5% each year. Which equation models the population, $p$, of the town $x$ years after 2010?

A. $p = 13{,}400(1.045)^x$

B. $p = 13{,}400(4.5)^x$

C. $p = 13{,}400(1.045x)$

D. $p = 13{,}400 + 4.5x$

25. Sarah earned $1,500 this summer. She mowed lawns for $15 per lawn and babysat for $20 per hour. Which equation represents her earnings from mowing $x$ lawns and babysitting $y$ hours?

A. $1{,}500 = xy(15 + 20)$

B. $1{,}500 = 5(x + y)$

C. $1{,}500 = 15x + 20y$

D. $1{,}500 = 35(x + y)$

26. Sunnydale had a population of 3,250 people in the year 2000. The population has been increasing by 2.5% every year after 2000. Which equation models the population, *P*, based on the number of years after 2000, *t*?

A. $P = 3{,}250(1.025)^{t - 2000}$

B. $P = 3{,}250(2.5)^{t - 2000}$

C. $P = 3{,}250(1.025)^{t}$

D. $P = 3{,}250(2.5)^{t}$

27. Jeremiah drank three 8-oz cups of coffee. Each cup of coffee contained 130 mg of caffeine. Jeremiah's body eliminates 13% of the caffeine each hour. Which equation represents the amount of caffeine, *C*, in his body after *t* hours?

A. $C = 130(0.13)^{t}$

B. $C = 390(0.13)^{t}$

C. $C = 130(0.87)^{t}$

D. $C = 390(0.87)^{t}$

28. The population of Austinberg on January 1, 2000 was 1.4 million. The population has decreased at a rate of 12% each year since. Which equation models the population (in millions), *p*, of Austinberg *t* years after January 1, 2000?

A. $p = 1.4(0.12)^{t}$

B. $p = 1.4(0.88)^{t}$

C. $p = 1.4(1.12)^{t}$

D. $p = 1.4(1.88)^{t}$

29. Thomas rented a van for $65 a day, plus $0.35 for each mile he drove over 3,000 miles. Thomas rented the van for 8 days and drove it *m* miles. Which equation models the total cost, *C*, that Thomas paid to rent the van if $m \geq 3{,}000$?

A. $C = 520 + 0.35(m - 3{,}000)$

B. $C = 520 + 0.35(m + 3{,}000)$

C. $C = 65 + 35(m - 3{,}000)$

D. $C = 65 + 0.35m$

30. The population of a town is growing by 2% every 3 years. There were 1,000 people living in the town in 1990. Which equation models the population of the town, *p*, *t* years after 1990?

A. $p = 1{,}000(0.98)^{\frac{t}{3}}$

B. $p = 1{,}000(1.02)^{\frac{t}{3}}$

C. $p = 0.98(1{,}000)^{\frac{t}{3}}$

D. $p = 1.02(1{,}000)^{\frac{t}{3}}$

31. A phone company charges a $45 monthly fee for 500 minutes of phone use. For each minute over 500, the phone company charges an additional $0.08. Which equation can be used to determine the total amount the company charges, *t*, for a phone call that is *m* minutes long, where *m* is greater than 500?

A. $t = 0.08m + 45$

B. $t = 45 - 0.08(m - 500)$

C. $t = 0.08(m - 500) + 45$

D. $t = 0.08(m + 500) + 45$

32. Amy invested \$3,200 at an annual interest rate of 8%. Which equation models the value of the investment, $V$, after $t$ years?

A. $V = 3{,}200(0.08)^t$

B. $V = 3{,}200(0.8)^t$

C. $V = 3{,}200(1.08)^t$

D. $V = 3{,}200(1.8)^t$

33. Steve and Marcia bought soda, chips, and gum.

- They bought twice as many chips as pieces of gum.
- They bought 3 fewer sodas than chips.
- Let $P$ represent the total items purchased, $s$ represent soda, $c$ represent chips, and $g$ represent gum.

Which set of equations could be used to model the amounts of items purchased?

A. $g = 2c$
$s = c - 3$
$P = s + c + g$

B. $c = 2g$
$s = c - 3$
$P = s + c + g$

C. $g = 2c$
$s = c + 3$
$P = s + c + g$

D. $c = 2g$
$s = c + 3$
$P = s + c + g$

34. Shelly invested \$1,000 at a rate of 5% interest per year. Which equation models the value of the investment, $V$, after $t$ years?

A. $V = 1{,}000 + 5t$

B. $V = 1{,}000 + 1.05t$

C. $V = 1{,}000(0.05)^t$

D. $V = 1{,}000(1.05)^t$