

1.

On Saturday afternoon, Armand sent m text messages each hour for 5 hours, and Tyrone sent p text messages each hour for 4 hours. Which of the following represents the total number of messages sent by Armand and Tyrone on Saturday afternoon?

- A) $9mp$
- B) $20mp$
- C) $5m + 4p$
- D) $4m + 5p$

2.

Kathy is a repair technician for a phone company. Each week, she receives a batch of phones that need repairs. The number of phones that she has left to fix at the end of each day can be estimated with the equation $P = 108 - 23d$, where P is the number of phones left and d is the number of days she has worked that week. What is the meaning of the value 108 in this equation?

- A) Kathy will complete the repairs within 108 days.
- B) Kathy starts each week with 108 phones to fix.
- C) Kathy repairs phones at a rate of 108 per hour.
- D) Kathy repairs phones at a rate of 108 per day.

3.

$$h = 3a + 28.6$$

A pediatrician uses the model above to estimate the height h of a boy, in inches, in terms of the boy's age a , in years, between the ages of 2 and 5. Based on the model, what is the estimated increase, in inches, of a boy's height each year?

- A) 3
- B) 5.7
- C) 9.5
- D) 14.3

4.

$1 \text{ decagram} = 10 \text{ grams}$ $1,000 \text{ milligrams} = 1 \text{ gram}$
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A hospital stores one type of medicine in 2-decagram containers. Based on the information given in the box above, how many 1-milligram doses are there in one 2-decagram container?

- A) 0.002
- B) 200
- C) 2,000
- D) 20,000



5.

Wyatt can husk at least 12 dozen ears of corn per hour and at most 18 dozen ears of corn per hour. Based on this information, what is a possible amount of time, in hours, that it could take Wyatt to husk 72 dozen ears of corn?



6.

The posted weight limit for a covered wooden bridge in Pennsylvania is 6000 pounds. A delivery truck that is carrying x identical boxes each weighing 14 pounds will pass over the bridge. If the combined weight of the empty delivery truck and its driver is 4500 pounds, what is the maximum possible value for x that will keep the combined weight of the truck, driver, and boxes below the bridge's posted weight limit?



7.

A landscaping company estimates the price of a job, in dollars, using the expression $60 + 12nh$, where n is the number of landscapers who will be working and h is the total number of hours the job will take using n landscapers. Which of the following is the best interpretation of the number 12 in the expression?

- A) The company charges \$12 per hour for each landscaper.
- B) A minimum of 12 landscapers will work on each job.
- C) The price of every job increases by \$12 every hour.
- D) Each landscaper works 12 hours a day.

8.

The sales manager of a company awarded a total of \$3000 in bonuses to the most productive salespeople. The bonuses were awarded in amounts of \$250 or \$750. If at least one \$250 bonus and at least one \$750 bonus were awarded, what is one possible number of \$250 bonuses awarded?

9.

A musician has a new song available for downloading or streaming. The musician earns \$0.09 each time the song is downloaded and \$0.002 each time the song is streamed. Which of the following expressions represents the amount, in dollars, that the musician earns if the song is downloaded d times and streamed s times?

- A) $0.002d + 0.09s$
- B) $0.002d - 0.09s$
- C) $0.09d + 0.002s$
- D) $0.09d - 0.002s$



10.

A quality control manager at a factory selects 7 lightbulbs at random for inspection out of every 400 lightbulbs produced. At this rate, how many lightbulbs will be inspected if the factory produces 20,000 lightbulbs?

- A) 300
- B) 350
- C) 400
- D) 450



11.

$$\ell = 24 + 3.5m$$

One end of a spring is attached to a ceiling. When an object of mass m kilograms is attached to the other end of the spring, the spring stretches to a length of ℓ centimeters as shown in the equation above. What is m when ℓ is 73?

- A) 14
- B) 27.7
- C) 73
- D) 279.5



12.

The amount of money a performer earns is directly proportional to the number of people attending the performance. The performer earns \$120 at a performance where 8 people attend.

How much money will the performer earn when 20 people attend a performance?

- A) \$960
- B) \$480
- C) \$300
- D) \$240



13.

The amount of money a performer earns is directly proportional to the number of people attending the performance. The performer earns \$120 at a performance where 8 people attend.

The performer uses 43% of the money earned to pay the costs involved in putting on each performance. The rest of the money earned is the performer's profit. What is the profit the performer makes at a performance where 8 people attend?

- A) \$51.60
- B) \$57.00
- C) \$68.40
- D) \$77.00



14.

When 4 times the number x is added to 12, the result is 8. What number results when 2 times x is added to 7?

- A) -1
- B) 5
- C) 8
- D) 9



15.

In a video game, each player starts the game with k points and loses 2 points each time a task is not completed. If a player who gains no additional points and fails to complete 100 tasks has a score of 200 points, what is the value of k ?

- A) 0
- B) 150
- C) 250
- D) 400



16.

A worker uses a forklift to move boxes that weigh either 40 pounds or 65 pounds each. Let x be the number of 40-pound boxes and y be the number of 65-pound boxes. The forklift can carry up to either 45 boxes or a weight of 2,400 pounds. Which of the following systems of inequalities represents this relationship?

A)
$$\begin{cases} 40x + 65y \leq 2,400 \\ x + y \leq 45 \end{cases}$$

B)
$$\begin{cases} \frac{x}{40} + \frac{y}{65} \leq 2,400 \\ x + y \leq 45 \end{cases}$$

C)
$$\begin{cases} 40x + 65y \leq 45 \\ x + y \leq 2,400 \end{cases}$$

D)
$$\begin{cases} x + y \leq 2,400 \\ 40x + 65y \leq 2,400 \end{cases}$$



17.

A coastal geologist estimates that a certain country's beaches are eroding at a rate of 1.5 feet per year. According to the geologist's estimate, how long will it take, in years, for the country's beaches to erode by 21 feet?



18.

If h hours and 30 minutes is equal to 450 minutes, what is the value of h ?



19.

A painter will paint n walls with the same size and shape in a building using a specific brand of paint. The painter's fee can be calculated by the expression $nK\ell h$, where n is the number of walls, K is a constant with units of dollars per square foot, ℓ is the length of each wall in feet, and h is the height of each wall in feet. If the customer asks the painter to use a more expensive brand of paint, which of the factors in the expression would change?

- A) h
- B) ℓ
- C) K
- D) n

20.

The number of states that joined the United States between 1776 and 1849 is twice the number of states that joined between 1850 and 1900. If 30 states joined the United States between 1776 and 1849 and x states joined between 1850 and 1900, which of the following equations is true?

- A) $30x = 2$
- B) $2x = 30$
- C) $\frac{x}{2} = 30$
- D) $x + 30 = 2$

21.

At Lincoln High School, approximately 7 percent of enrolled juniors and 5 percent of enrolled seniors were inducted into the National Honor Society last year. If there were 562 juniors and 602 seniors enrolled at Lincoln High School last year, which of the following is closest to the total number of juniors and seniors at Lincoln High School last year who were inducted into the National Honor Society?

- A) 140
- B) 69
- C) 39
- D) 30



22.

The average number of students per classroom at Central High School from 2000 to 2010 can be modeled by the equation $y = 0.56x + 27.2$, where x represents the number of years since 2000, and y represents the average number of students per classroom. Which of the following best describes the meaning of the number 0.56 in the equation?

- A) The total number of students at the school in 2000
- B) The average number of students per classroom in 2000
- C) The estimated increase in the average number of students per classroom each year
- D) The estimated difference between the average number of students per classroom in 2010 and in 2000



23.

Nate walks 25 meters in 13.7 seconds. If he walks at this same rate, which of the following is closest to the distance he will walk in 4 minutes?

- A) 150 meters
- B) 450 meters
- C) 700 meters
- D) 1,400 meters



24.

Tickets for a school talent show cost \$2 for students and \$3 for adults. If Chris spends at least \$11 but no more than \$14 on x student tickets and 1 adult ticket, what is one possible value of x ?



25.

The monthly membership fee for an online television and movie service is \$9.80. The cost of viewing television shows online is included in the membership fee, but there is an additional fee of \$1.50 to rent each movie online. For one month, Jill's membership and movie rental fees were \$12.80. How many movies did Jill rent online that month?

- A) 1
- B) 2
- C) 3
- D) 4



26.

One of the requirements for becoming a court reporter is the ability to type 225 words per minute. Donald can currently type 180 words per minute, and believes that with practice he can increase his typing speed by 5 words per minute each month. Which of the following represents the number of words per minute that Donald believes he will be able to type m months from now?

- A) $5 + 180m$
- B) $225 + 5m$
- C) $180 + 5m$
- D) $180 - 5m$



27.

If a 3-pound pizza is sliced in half and each half is sliced into thirds, what is the weight, in ounces, of each of the slices? (1 pound = 16 ounces)

- A) 4
- B) 6
- C) 8
- D) 16



28.

Nick surveyed a random sample of the freshman class of his high school to determine whether the Fall Festival should be held in October or November. Of the 90 students surveyed, 25.6% preferred October. Based on this information, about how many students in the entire 225-person class would be expected to prefer having the Fall Festival in October?

- A) 50
- B) 60
- C) 75
- D) 80



29.

The density of an object is equal to the mass of the object divided by the volume of the object. What is the volume, in milliliters, of an object with a mass of 24 grams and a density of 3 grams per milliliter?

- A) 0.125
- B) 8
- C) 21
- D) 72



30.

Last week Raul worked 11 more hours than Angelica. If they worked a combined total of 59 hours, how many hours did Angelica work last week?

- A) 24
- B) 35
- C) 40
- D) 48



31.

A partially filled pool contains 600 gallons of water. A hose is turned on, and water flows into the pool at the rate of 8 gallons per minute. How many gallons of water will be in the pool after 70 minutes?



32.

The normal systolic blood pressure P , in millimeters of mercury, for an adult male x years old can be modeled by the equation $P = \frac{x + 220}{2}$. According to the model, for every increase of 1 year in age, by how many millimeters of mercury will the normal systolic blood pressure for an adult male increase?

