EXERCISE 2: Answers for this exercise start on page 353.

1

Which of the following represents the square of the sum of x and y, decreased by the product of x and y ?

A) $x^2 + y^2 - xy$

B) $x^2y^2 - xy$

C) $(x+y)^2 - (x+y)$

D) $(x+y)^2 - xy$

2

An internet service provider charges a one time setup fee of \$100 and \$50 each month for service. If c customers join at the same time and are on the service for m months, which of the following expressions represents the total amount, in dollars, the provider has charged these customers?

A) $100c + 50m$

B) $100c + 50cm$

C) $150cm$

D) $100m + 50cm$

3

To prepare for landing, a plane descends so that its altitude decreases at a constant rate from 24,500 feet to 17,900 feet in 12 minutes. Which of the following equations gives the altitude A, in feet, of the plane t minutes after its descent began, for $0 \leq t \leq 12$?

A) $A = 17{,}900 - 550t$

B) $A = 17{,}900 + 550t$

C) $A = 24{,}500 - 550t$

D) $A = 24{,}500 + 550t$

4

A customer at a grocery store bought 4 times as many bags of rice as bags of pasta. Each bag of rice cost \$2.86 and each bag of pasta cost \$3.41. If the customer spent a total of \$103.95 on rice and pasta, how many bags of rice did the customer buy?

5

The Pirates won exactly 4 of their first 15 games. They then played N remaining games and won all of them. If they won exactly half of all the games they played, what is the value of N ?

6

When ordering a certain book in bulk, a school pays \$1,720 for the first 80 copies and a discounted price for each additional copy. The total cost for 200 copies of the book is \$3,700. Which function f gives the total cost, in dollars, for x copies of the book, where $x \geq 80$?

A) $f(x) = 18.50x + 240$

B) $f(x) = 18.50x + 1{,}720$

C) $f(x) = 16.50x + 400$

D) $f(x) = 16.50x + 1{,}720$

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7

It will take 5 hours for a group of n volunteers to plant a total of 180 trees. Each tree takes 15 minutes to plant. Which equation represents this situation?

A) $\left(\frac{180}{15}\right)n = (5)(60)$

B) $\left(\frac{60}{15}\right)n = (180)(5)$

C) $(5)(60)n = (180)(15)$

D) $(5)(15)n = (180)(60)$

8

A tub can be filled by a hose and emptied by a drain. When the drain is closed, the hose can fill $\frac{1}{3}$ of the tub in 1 minute. When the hose is turned off, the drain can empty $\frac{2}{11}$ of the tub in 1 minute. If it takes t minutes for the hose to fill the tub while the drain is open, which of the following equations represents this situation?

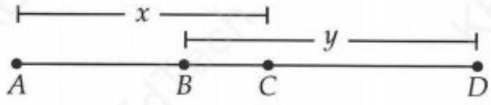
A) $\frac{1}{3}t - \frac{2}{11} = 1$

B) $\frac{1}{3} - \frac{2}{11} = \frac{1}{t}$

C) $\frac{1}{3}t + \frac{2}{11} = 1$

D) $\frac{1}{3} + \frac{2}{11} = \frac{1}{t}$

9



Note: Figure not drawn to scale.

For line segment $\overline{AD}$ shown, $AD = 50$ and $BC = 10$. Which equation shows the relationship between the lengths of AC, BD, and AD?

A) $x + y + 10 = 50$

B) $x + y - 5 = 50$

C) $x + y - 10 = 50$

D) $x + y - 20 = 50$

10

An accounting company currently has three times as many junior accountants as senior accountants. The company plans to hire 140 more senior accountants so that the number of junior accountants is twice the number of senior accountants. How many junior accountants does the accounting company currently have?

840

11

Alice and Trinity pack boxes of specialized equipment for delivery. When they are each working alone, Alice can pack 10 boxes every 3 hours and Trinity can pack 15 boxes every x hours. Working together at their respective rates, Alice and Trinity can pack 115 boxes in 12 hours. Which of the following equations represents this situation?

A) $115\left(\frac{3}{10} + \frac{x}{15}\right) = 12$

B) $12\left(\frac{3}{10} + \frac{x}{15}\right) = 115$

C) $12\left(\frac{10}{3} + \frac{15}{x}\right) = 1$

D) $12\left(\frac{10}{3} + \frac{15}{x}\right) = 115$

12

A bakery gave out coupons to celebrate its grand opening. Each coupon was worth either \$1, \$3, or \$5. Twice as many \$1 coupons were given out as \$3 coupons, and 3 times as many \$3 coupons were given out as \$5 coupons. The total value of all the coupons given out was \$360. How many \$3 coupons were given out?

A) 40

B) 45

C) 48

D) 54

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13

Yoona runs at a constant rate of 1 yard per second. Jessica runs 4 times as fast as Yoona. If Jessica gives Yoona a head start of 30 yards in a race, how many yards must Jessica run to catch up to Yoona?

40

14

Of the 200 jellybeans in a jar, 70% are green and the rest are red. How many green jellybeans must be removed so that 60% of the remaining jellybeans are green?

50

15

To move into a new studio space, the m members of an art club agreed to split the first month's rent of r dollars equally among themselves. If k of the members fail to pay their share, which of the following represents the additional amount, in dollars, that each of the remaining members must pay to cover the first month's rent?

A) $\frac{r}{m-k}$

B) $\frac{kr}{m-k}$

C) $\frac{kr(m-k)}{m}$

D) $\frac{kr}{m(m-k)}$

r

$\$\frac{r}{m}$

m−k

$\frac{\$8}{4}=\$2$

$\frac{\$8}{2}=\$4$

$\therefore \$2$

$\frac{r}{m-k} > \frac{r}{m}$

$\frac{r}{m-k} - \frac{r}{m}$

$= \frac{r\cdot m - r\cdot(m-k)}{m(m-k)} = \frac{rm - rm + kr}{m(m-k)} = \frac{kr}{m(m-k)}$

16

Terry is hired to pave a parking lot and finishes $\frac{1}{3}$ of the parking lot before Andy is hired to work alongside him. They each work at a constant rate, but Terry works faster than Andy does. The equation $9\left(\frac{1}{x}+\frac{1}{x+4}\right)=\frac{2}{3}$ can be used to find the total number of days x it would have taken Terry to pave the entire parking lot by himself. Which of the following is the best interpretation of the number 9 in the equation?

A) The number of days it would have taken Terry and Andy to pave the entire parking lot if they had worked together from the start.

B) The number of days it will take Terry and Andy to pave the remainder of the parking lot working together.

C) The number of days it would take Andy to pave the remainder of the parking lot if he were working alone.

D) The number of days it would take Terry to pave the remainder of the parking lot if he were working alone.

17

A chemist wants to make 800 milliliters of a 40% alcohol solution by mixing a 25% alcohol solution with a 50% alcohol solution. How many milliliters of the 25% alcohol solution should the chemist use?

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