

Creating Equations from a Context

Name: Key

1. Juan's cell phone company charges \$35 a month for phone service plus \$0.50 for each text message. How many text messages does Juan send in a month if his bill was \$52?

Variable: x: # of text messages

Equation: $35 + 0.50x = 52$

Solution: 34 messages

$$\begin{array}{r} 35 + 0.50x = 52 \\ -35 \quad -35 \\ \hline 0.50x = 17 \\ \frac{0.50x}{0.50} = \frac{17}{0.50} \\ x = 34 \end{array}$$

2. Friendship's soccer team purchased uniforms and equipment for a total cost of \$912. The equipment cost \$612, and the uniforms cost \$25 each. How many uniforms did the school purchase?

Variable: x: # of uniforms

Equation: $612 + 25x = 912$

Solution: 12 uniforms

$$\begin{array}{r} 612 + 25x = 912 \\ -612 \quad -612 \\ \hline 25x = 300 \\ \frac{25x}{25} = \frac{300}{25} \\ x = 12 \end{array}$$

3. Long's Coffee Shop sells a refill mug for \$8.95. Each refill costs \$1.50. Last month, Jalissa spent \$26.95 on a mug and refills. How many refills did she buy?

Variable: x: # of refills

Equation: $8.95 + 1.50x = 26.95$

Solution: 12 refills

$$\begin{array}{r} 8.95 + 1.50x = 26.95 \\ -8.95 \quad -8.95 \\ \hline 1.50x = 18.00 \\ \frac{1.50x}{1.50} = \frac{18.00}{1.50} \\ x = 12 \end{array}$$

4. The bill for the repair of a computer was \$179. The cost for parts was \$44, and the labor charge was \$45 per hour. How many hours did it take to repair the computer?

Variable: x: # of hours

Equation: $44 + 45x = 179$

Solution: 3 hours

$$\begin{array}{r} 44 + 45x = 179 \\ -44 \quad -44 \\ \hline 45x = 135 \\ \frac{45x}{45} = \frac{135}{45} \\ x = 3 \end{array}$$

5. The Elk Grove Bowling Alley offers a special. Each game costs \$2.50, and shoe rental \$2. You spend \$14.50 total. How many games did you bowl?

Variable: # of games

Equation: $2.50x + 2 = 14.50$

Solution: 5 games

$$\begin{array}{r} 2.50x + 2 = 14.50 \\ -2 \quad -2 \\ \hline 2.50x = 12.50 \\ \frac{2.50x}{2.50} = \frac{12.50}{2.50} \\ x = 5 \end{array}$$

6. Sandra scores 4 baskets in his first basketball game. She then scored the same number of baskets in each of her next 3 games. If Sandra made 19 baskets total, how many baskets did she score in each of the three games?

Variable: x : # of baskets

Equation: $4 + 3x = 19$

Solution: 5 baskets

$$\begin{array}{r} 4 + 3x = 19 \\ -4 \quad -4 \\ \hline 3x = 15 \\ \frac{3x}{3} = \frac{15}{3} \\ x = 5 \end{array}$$

7. You and three friends go to the town carnival. You have a coupon for \$20 off that will save your group money! If the total bill to get into the carnival was \$100, how much does one regular price ticket cost?

Variable: x : price of 1 ticket

Equation: $4x - 20 = 100$

Solution: \$30 per ticket

$$\begin{array}{r} 4x - 20 = 100 \\ +20 \quad +20 \\ \hline 4x = 120 \\ \frac{4x}{4} = \frac{120}{4} \\ x = 30 \end{array}$$

8. A new one-year membership at RecPlex costs \$160. A registration fee of \$28 is paid up front, and the rest is paid monthly. How much do new members pay each month?

Variable: x : cost each month

Equation: $28 + 12x = 160$

Solution: \$11 each month

$$\begin{array}{r} 28 + 12x = 160 \\ -28 \quad -28 \\ \hline 12x = 132 \\ \frac{12x}{12} = \frac{132}{12} \\ x = 11 \end{array}$$

9. It costs Raquel \$5 in tolls to drive to work and back each day, plus she uses 3 gallons of gas. It costs her a total of \$15.50 to drive to work and back each day. How much per gallon is Raquel paying for her gas?

Variable: x : cost per gallon

Equation: $5 + 3x = 15.50$

Solution: \$3.50 per gallon

$$\begin{array}{r} 5 + 3x = 15.50 \\ -5 \quad -5.00 \\ \hline 3x = 10.50 \\ \frac{3x}{3} = \frac{10.50}{3} \\ x = 3.5 \end{array}$$

10. Solve the following equations:

a. $8(7x - 1) = 6(-4 + 8x)$

$$\begin{array}{r} 56x - 8 = -24 + 48x \\ -48x \quad -48x \\ \hline 8x - 8 = -24 \\ +8 \quad +8 \\ \hline 8x = -16 \\ \frac{8x}{8} = \frac{-16}{8} \\ \boxed{x = -2} \end{array}$$

b. $5 + 3(1 + 7x) = 4(6 + 5x) - 3x$

$$\begin{array}{r} 5 + 3 + 21x = 24 + 20x - 3x \\ 8 + 21x = 24 + 17x \\ -17x \quad -17x \\ \hline 8 + 4x = 24 \\ -8 \quad -8 \\ \hline 4x = 16 \\ \frac{4x}{4} = \frac{16}{4} \\ \boxed{x = 4} \end{array}$$

c. $3(3x + 1) - 5(3x - 1) = -7x - x$

$$\begin{array}{r} 9x + 3 - 15x + 5 = -8x \\ -6x + 8 = -8x \\ +6x \quad +6x \\ \hline 8 = -2x \\ \frac{8}{-2} = \frac{-2x}{-2} \\ \boxed{-4 = x} \end{array}$$