

Solving Equations Quiz RECAP

$$\begin{aligned} \textcircled{\#2} \quad 8 - \frac{1}{3}X &= 16 \\ -8 \quad \quad \quad -8 \\ \hline -\frac{1}{3}X &= 8 \\ \frac{-X}{-1} &= \frac{24}{-1} \\ X &= -24 \end{aligned}$$

$$\begin{aligned} \textcircled{\#4} \quad -4X - 7 - 3X + 4 &= 25 \\ -7X - 3 &= 25 \\ +3 \quad +3 \\ \hline -7X &= 28 \\ \frac{-7X}{-7} &= \frac{28}{-7} \\ X &= -4 \end{aligned}$$

$$\begin{aligned} \textcircled{\#6} \quad -79 &= 7X + 3(4X - 1) \\ -79 &= 7X + 12X - 3 \\ -79 &= 19X - 3 \\ +3 \quad \quad +3 \\ \hline -76 &= 19X \\ \frac{-76}{19} &= \frac{19X}{19} \\ -4 &= X \end{aligned}$$

$$\begin{aligned} \textcircled{\#7} \quad 6(m-1) &= 3(2m+5) \\ 6m - 6 &= 6m + 15 \\ -6m \quad -6m \\ \hline -6 &= 15 \end{aligned}$$

$$\begin{aligned} \textcircled{\#11} \quad \frac{3}{4}X + 2 &= \frac{3}{8}X - 4 \\ \frac{24}{4}X + \frac{16}{1} &= \frac{24}{8}X - \frac{32}{1} \\ 6X + 16 &= 3X - 32 \end{aligned}$$

$$\begin{aligned} \textcircled{\#13} \quad 2(-4X^2 + 2X - 8) &- (3X - 2) \\ -8X^2 + 4X - 16 &- 3X + 2 \end{aligned}$$

$$\begin{aligned} \textcircled{B} \quad & \frac{m-v}{-m} = \frac{k}{-m} \\ & \frac{-v}{-1} = \frac{k-m}{-1} \\ & v = -k+m \\ & \hookrightarrow m-k \end{aligned}$$

$$\begin{aligned} \textcircled{F} \quad & m = \frac{1}{a}(d_1 + d_2) \\ & \frac{2m}{-d_2} = \frac{d_1 + d_2}{-d_2} \\ & 2m - d_2 = d_1 \end{aligned}$$

$$\begin{aligned} \textcircled{E} \quad & W = \frac{x}{y} - z \\ & \frac{+z}{+z} \\ & y(W+z) = \frac{x}{y} \cdot y \\ & x = y(W+z) \end{aligned}$$

$$\begin{aligned} \textcircled{G} \quad & 2r = \frac{5s}{2} - \frac{s}{4} \\ & 2r = \frac{10s}{4} - \frac{s}{4} \\ & 2r = \frac{9s}{4} \\ & \frac{8r}{9} = \frac{9s}{9} \\ & s = \frac{8r}{9} \end{aligned}$$

Creating Equations in One Variable

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? How do you know?

How would you articulate your solving process into steps for others to follow?

Creating Equations from Context

1. Read the problem statement carefully.
2. Reread the scenario and make a list of the known quantities.
3. Read the statement again, identifying the unknown quantity or variable.
4. Create an equation from the known quantities and variable(s).
5. Solve the equation for the variable.
6. Interpret the solution of the equation in terms of the context of the problem and convert units if necessary.

Plus One: Write your answer to real-world application exercises in a complete sentence!

Use the word problem strategy to create and solve an equation for the exercise below.

Hayden bought 4 tickets to a football game. He paid a 5% service charge for buying them from a broker. His total cost was \$105.00. What was the price of each ticket, not including the service charge?

$t = \text{cost per ticket}$

$$4t + 0.05(4t) = 105$$

$$4t + .2t = 105$$

$$\frac{4.2t = 105}{4.2 \quad 4.2}$$

$$t = 25$$

The cost of each ticket is \$25.

Use the word problem strategy to create and solve an equation for the exercise below.

It cost Justin \$100 to have cable TV installed in his house. Each month he pays an access fee plus a tax of 7% of his monthly bill. After 6 months, Justin had paid a total of \$350.38 for his access fee, taxes, and his initial installation. What is Justin's monthly access fee not including taxes?

$x =$ monthly access fee

$$100 + 6(x + .07x) = 350.38$$

$$100 + 6(1.07x) = 350.38$$

$$\begin{array}{r} 100 + 6.42x = 350.38 \\ -100 \qquad \qquad -100 \\ \hline \end{array}$$

$$\begin{array}{r} 6.42x = 250.38 \\ \hline 6.42 \quad 6.42 \end{array}$$

$$x = 39$$

The monthly access fee is \$39.

Two trains heading toward each other are 400 miles apart. One train travels 15 miles per hour faster than the other train. If they arrive at the same station in 5 hours, how fast is each train traveling?



Importance of Units

1. What units would you use for the rate of each scenario that follows?

a. riding a bicycle

miles per hour; feet per minute

b. rainfall during a storm

inches per hour

c. water coming from a fire hydrant

gallons per minute

d. watching caloric intake

calories per day

*How
would
you
describe
the rate
of each
scenario?*

Units give numbers meaning in context.

Driving to your friend's house, you travel at an average rate of 35 miles per hour. On your way home, you travel at an average rate of 40 miles per hour. If the round trip took you 45 minutes, how far is it from your house to your friend's house?

What do you notice about the units in this exercise?

How do different units impact your problem solving process?

1.) Matthew's goal is to average a 90 on his tests in Algebra. His grades on the first four test were 85%, 93%, 88%, and 94%. Write and solve an equation to find what score Matthew must receive on the fifth test to receive an average of 90.

$X =$ test score
on test #5

$$\frac{85 + 93 + 88 + 94 + X}{5} = 90$$

$$\frac{360 + X}{5} = 90$$

$$\begin{array}{r} 360 + X = 450 \\ -360 \quad -360 \\ \hline X = 90 \end{array}$$

2.) Your test scores are 75, 93, 90, 82, and 85. What is the lowest score you can earn on the next test to achieve and average of 86?

$X =$ score
on test #6

$$86 = \frac{75 + 93 + 90 + 82 + 85 + X}{6}$$

$$\frac{425 + X}{6} = 86$$

$$\begin{array}{r} 425 + X = 516 \\ -425 \quad -425 \\ \hline X = 91 \end{array}$$