OJH Math Team, Units, 8 Oct 2025 Solutions

$$\frac{3xy}{x} = \mathbf{3y}$$

$$\frac{3xy^2}{x} * \frac{2z}{3y} = \mathbf{2yz}$$

Treat units like **variables**

If the same unit or variable is in the numerator and denominator, you can **cancel them out.**

Don't **multiply** something you are going to have to **divide** later.

If : 1 foot = 12 inches

Then: $\frac{1\ foot}{12\ inches} = \mathbf{1}$

How many cups are in 2 gallons? (1 gallon is 4 quarts. 1 quart is 4 cups.)

$$2\ gallons * \frac{4\ quarts}{1\ gallon} * \frac{4\ cups}{1\ quart} = \mathbf{32\ cups}$$

Steve can run 440 yards in 90 seconds. How many miles per hour is that?

$$\frac{440\ yards}{90\ seconds} * \frac{60\ seconds}{1\ minute} * \frac{60\ minutes}{1\ hour} * \frac{1\ mile}{1760\ yards} = 10\frac{miles}{hour}$$

Practice problem solutions.

Lucy can ride her bike at 20 km/hour. How many meters/second is that? Express your answer as a common fraction.

$$20\,\frac{km}{hour} * \frac{1000\,m}{1\,km} * \frac{1\,hour}{60\,minutes} * \frac{1\,minutes}{60\,seconds} = \mathbf{\frac{50}{9}}$$

How many flurgs is 5 slurgs?

5 burgs = 7 purgs 2 flurgs = 3 purgs 2 slurgs = 3 burgs

$$5\,slurgs * \frac{3\,burgs}{2\,slurgs} * \frac{7\,purgs}{5\,burgs} * \frac{2\,flurgs}{3\,purgs} = \mathbf{7\ flurgs}$$

A cube has a side length of 2 yards.

What is the volume of the cube in cubic yards?

(2 yards) * (2 yards) * (2 yards) = **8 yards^3**

What is the volume of the cube in cubic feet?

$$(8\,yards^3) * \frac{3\,feet}{1\,yard} * \frac{3\,feet}{1\,yard} * \frac{3\,feet}{1\,yard} = \mathbf{216\ feet^3}$$

Convert 42 miles to malarkey.

$$42\,miles * \frac{8\,tootle}{1\,mile} * \frac{55\,ballyhoo}{6\,tootle} * \frac{60\,malarkey}{7\,ballyhoo} = \mathbf{26400\ malarkey}$$

Convert 528 kelter to hours =

$$528\,keter * \frac{3\,quatsh}{20\,kelter} * \frac{5\,fandangle}{12\,quatsh} * \frac{3\,hours}{11\,fandangle} = \mathbf{9\ hours}$$

Convert 12 mph to ballyhoo/tosh

$$12\,\frac{miles}{hour} * \frac{8\,tootles}{1\,miles} * \frac{55\,ballyhoo}{6\,tootle} * \frac{1\,hour}{60\,minutes} * \frac{3\,minutes}{11\,tosh} = \mathbf{4\ ballyhoo/tosh}$$