

Math 8 Unit 2

2.3 Proportional Reasoning

A proportion is a relationship that says that two ratios or two rates are equal.

Could be expressed in fraction form:

$$\frac{30\text{km}}{4\text{ hrs}} = \frac{?}{9\text{ hrs}}$$

$$\begin{array}{l} 2 : 4 \\ ? : 8 \end{array}$$

You can solve proportional reasoning problems using several different methods.

Example: A potato farmer can plant three potato plants per 0.5 m^2 . How many potato plants can she plant in an area of 85 m^2 ?

Use a unit rate:

$$\begin{array}{l} \frac{3\text{ plants}}{0.5\text{ m}^2} = \frac{6\text{ plants}}{1\text{ m}^2} \\ \frac{6\text{ plants}}{1\text{ m}^2} \times 85\text{ m}^2 = 510\text{ plants} \end{array}$$

Use a proportion:

$$\frac{3\text{ plants}}{0.5\text{ m}^2} = \frac{?}{85\text{ m}^2}$$

plants 510

Electricity costs 11.58 cents for 2 kWh. How much does 30 kWh cost? Give your answer to the nearest cent.

$$\frac{11.58}{2} = \frac{?}{30}$$

It would cost 173.7 cents for 30kwh.

There are 72 players on 8 baseball teams. Determine the number of players on 2 teams.

Show how you got your answer in 2 different ways!

$$\frac{72}{8} = \frac{x}{2}$$

$x = 18$ players on 2 teams

$$\frac{72\text{ players}}{8\text{ teams}}$$

= 9 players/team

$$\frac{9\text{ players}}{1\text{ team}} \times 2\text{ teams}$$

= 18 players on 2 teams

Determine the missing values:

a) $\frac{3}{?} = \frac{18}{24} = \frac{?}{12}$

b) $\frac{48\text{km}}{\$16} = \frac{144\text{km}}{?} = \frac{?}{\$64}$

David can saw a log into three pieces in 7 minutes. If he continues sawing at a constant rate, how long will it take him to saw a similarly log into six pieces?

$$\frac{3\text{ pieces}}{7\text{ minutes}} = \frac{6\text{ pieces}}{x}$$

$x = 14$ minutes

It would take 14 minutes for 6 pieces.