

Proportional Reasoning

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* A proportion is a relationship (equation) that links 2 ratios or 2 rates that are equivalent.

ex. $\frac{5}{10} = \frac{50}{100}$ $\frac{60 \text{ beats}}{3 \text{ min}} = \frac{20 \text{ beats}}{1 \text{ min}}$

* To solve proportions choose a method:

- ① Cross-multiply and divide
- ② Find a "multiplier"
- ③ Find the unit rate, then multiply (useful for word problems with rates)

Ex. Find the missing number:

a) $\frac{15}{80} = \frac{3}{?}$

$80 \times 3 \div 15 = 16$

b) $\frac{25}{70} = \frac{x}{12}$

$25 \times 12 \div 70 = 4.3$ or 4.29

$4.2857\dots$

Ex. There are 72 soccer players on 8 teams.
How many soccer players are on 3 teams?

Method ① CM+D

$\frac{72 \text{ P}}{8 \text{ T}} = \frac{? \text{ P}}{3 \text{ T}}$

$72 \times 3 \div 8 = 27 \text{ players per 3 teams}$

Method ② Find unit rate

$\frac{72 \text{ P}}{8 \text{ T}} \div 8 = \frac{9 \text{ P}}{1 \text{ T}} \times 3 = \frac{27 \text{ P}}{3 \text{ T}}$

same!
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$$\frac{72 \cancel{P} \cdot 8}{8 \cancel{T} \div 8} = \frac{7 \cancel{P} \cdot 8}{1 \cancel{T} \cdot 3} = \frac{21 \cancel{T}}{3 \cancel{T}}$$

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