7-1 Ratio and Proportion

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What is a ratio? A **ratio** is the comparison of 2 numbers, using division.

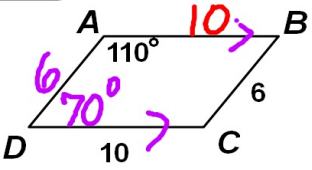
How do you write a ratio?

the "ratio of a to b" ($b \neq 0$) $\frac{a}{b}$ or $a:b$

the ratio of 1 meter to .5 meter $\frac{1.0}{.5} = \frac{2}{1}$ or $2:1$

the ratio of $6a^2$ to $12abc$ $\frac{1}{2}\frac{6a^2}{12abc} = \frac{a}{2bc}$ or $a:2bc$

ex. 1 *Given:* ▱ *ABCD. Find each ratio in simplest form.*



AB : BC $10:6 = 5:3$ (÷2)

AB : perimeter of ABCD $10:32 = 5:16$

$m\angle A : m\angle D$ $110:70 = 11:7$

An ***extended ratio*** compares 3 or more numbers.

the "ratio of c to d to e"

$c:d:e$

ex. 2 The ratio of 3 sides of a triangle is 3 : 4 : 5 and the perimeter is 96 cm. Find the longest side. 40 cm.

$3x, 4x, 5x$ = 3 sides of Δ

$3x + 4x + 5x = 96$

$12x = 96$

$x = 8$

CK

24

32

+40

96 ✓

A *proportion* is an equation showing 2 equal ratios. $\frac{2}{3} = \frac{12}{18}$

the proportion " *a* is to *b* as *c* is to *d* "

$\frac{a}{b} = \frac{c}{d}$ or $a:b = c:d$

a, b, c, and *d* are called *terms*

$\frac{\text{1st term}}{\text{2nd term}} = \frac{\text{3rd term}}{\text{4th term}}$

1st and 4th terms are *extremes*

2nd and 3rd terms are *means*

An *extended proportion* shows 3 or more ratios equal.

" *a* is to *b* as *c* is to *d* as *e* is to *f* " $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$