

Ratios

Ratio - a comparison of two quantities using division. Written as $\frac{a}{b}$ or $a:b$.

*Both are demonstrating the operation $a \div b$
- $a:b$ is read as a to b

Ex) Sara has 3 hats and 2 scarves:

a) Compare hats to scarves

$$\frac{3}{2} \text{ or } 3:2$$

b) Compare scarves to hats

$$\frac{2}{3} \text{ or } 2:3$$

Ex) The area of a tennis court is 2106 ft^2 ,
the area of a handball court is 520 ft^2 .
Compare the area of the tennis court
to the area of the handball court.

$$\frac{\text{tennis}}{\text{handball}} = \frac{2106 \text{ ft}^2}{520 \text{ ft}^2} = \frac{1053 \text{ ft}^2}{260 \text{ ft}^2} = \frac{81 \text{ ft}^2}{20 \text{ ft}^2} = \frac{81}{20}$$

Notice - in order to properly compare quantities with units, the units must be the same.

Ex) find the ratio of 2 ft to 10 in

$$\frac{2 \text{ ft}}{10 \text{ in}} = \frac{\cancel{24} \text{ in}}{\cancel{10} \text{ in}} = \frac{24 \text{ in}}{10 \text{ in}} = \frac{12}{5} \text{ or } 2.4$$

Note - 2 ft is 2.4 times 10 in

Ex) Find the Ratio of 60 cents to a dollar.

$$\frac{60 \text{ cents}}{1 \text{ dollar}} = \frac{60 \text{ cents}}{100 \text{ cents}} = \frac{3}{5} \text{ or } 0.6 \text{ or } 3:5$$

Ex) Find the ratio of $3x$ to $5x$

$$\frac{3x}{5x} = \frac{3}{5} \text{ or } 3:5 \text{ or } 0.6$$

Ex) Find the ratio of $\frac{1}{2}$ to $\frac{1}{3}$

$$\frac{\frac{1}{2}}{\frac{1}{3}} = \frac{1}{2} \div \frac{1}{3} = \frac{1}{2} \cdot \frac{3}{1} = \frac{3}{2}$$

Notice - In order to properly compare quantities with units, the units must be the same.

Ex) Find the ratio of 5 ft to 10 in

$$\frac{5 \text{ ft}}{10 \text{ in}} = \frac{5 \cdot 12 \text{ in}}{10 \text{ in}} = \frac{60 \text{ in}}{10 \text{ in}} = 6$$

Note - 5 ft is 60 times 10 in