

Questions 6.1 Essential Question: **How do you use proportions?**

Ratio: A comparison of two numbers

"3 to 5" $3 : 5$ $\frac{3}{5}$ (get same units)

Example 1: A bonsai tree is 18 in wide and stands 2 ft tall. What is the ratio of the width of the bonsai to its height?

$2 \times 12 = 24 \text{ in}$

$18 \text{ in} : 24 \text{ in}$

$3 \text{ in} : 4 \text{ in}$

Useful Conversions:

- 12 in = 1 ft
- 3 ft = 1 yd
- 5280 ft = 1 mi
- 16 oz = 1 lb
- 100 cm = 1 m
- 10 mm = 1 cm

Example 2: Write the ratio of the first measurement to the second measurement: $24 + 4 = 28 \text{ in}$

- a) diameter of a table tennis ball: $40 \text{ mm} / 10 = 4 \text{ cm}$ b) length of a tennis racket: 2 ft 4 in
 diameter of a tennis ball: 6.8 cm length of table tennis paddle: 10 in

$4 \text{ cm} : 6.8 \text{ cm}$
 $1 \text{ cm} : 1.7 \text{ cm}$

$40 \text{ mm} : 68 \text{ mm}$

$28 \text{ in} : 10 \text{ in}$
 $14 \text{ in} : 5 \text{ in}$

Example 3: The measures of two supplementary angles are in the ratio 1 : 4. What are the angle measures? $1 + 4 = 5$ $180/5 = 36$ $36, 4(36) = 36, 144$

$1x + 4x = 180$

$5x = 180$ $x = 36$

$36, 144$

Questions

Example 4: A baseball team played 154 regular season games. The ratio of the number of games they won to the number of games they lost was 5 : 2. How many games did they win? How many games did they lose?

110 W, 44 L

Example 5: The measures of two supplementary angles are in the ratio 5 : 7. What are the angle measures?

75, 105

Questions

Example 6: The lengths of the sides of a triangle are in the extended ratio 4 : 7 : 9. The perimeter is 60 cm. What are the lengths of the sides?

$$4x + 7x + 9x = 180$$

Example 7: The measure of the angles of a triangle are in the extended ratio 4 : 3 : 2. What is the measure of the largest angle?

80

Proportion: **Setting 2 ratios equal**

$$\frac{a}{b} = \frac{c}{d} \quad a * d = c * b$$

Example 9:

Solve each proportion.

a. $\frac{x}{5} = \frac{12}{7}$ $7x = 5(12)$ b. $\frac{y+3}{8} = \frac{y}{4}$ $y=3$

$$7x = 60$$

$$x = 60/7$$

$$x = 8.571428$$

c. $\frac{x+1}{3} = \frac{x}{2}$ $x=2$

$$2(x+1) = 3x$$

$$2x+2 = 3x$$

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Summary: