

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 in : 24 in

3 in : 4 in

Useful Conversions:

$$12 \text{ in} = 1 \text{ ft}$$

$$3 \text{ ft} = 1 \text{ yd}$$

$$5280 \text{ ft} = 1 \text{ mi}$$

$$16 \text{ oz} = 1 \text{ lb}$$

$$100 \text{ cm} = 1 \text{ m}$$

$$10 \text{ mm} = 1 \text{ cm}$$

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 cm : 6.8 cm

40 mm : 68 mm

28 in : 10 in

1 cm : 1.7 cm

14 in : 5 in

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

$$1x + 4x = 180 \quad 5x = 180 \quad x = 36$$

$$36, 144$$

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

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

$$2x+2 = 3x$$