

## Main Ideas/Questions

## Notes

## What is a RATIO?

- A comparison of two (or more) quantities.
- Ways to represent a ratio:  $\frac{a}{b}$ ;  $a:b$ ;  $a$  to  $b$
- Ratios can be simplified.

## Example:

A music store has 40 trumpets, 39 clarinets, 24 violins, 51 flutes, and 16 trombones in stock. Give each as a simplified ratio.

1. Trumpets to violins.

$$\frac{40}{8} : \frac{24}{8} \rightarrow 5 : 3$$

2. Flutes to clarinets

$$\frac{51 \div 3}{39 \div 3} = \frac{17}{13}$$

3. Trombones to trumpets.

$$\frac{16}{3} \text{ to } \frac{40}{3} \rightarrow 2 \text{ to } 5$$

4. Violins to total instruments.

$$\frac{24}{2} : \frac{170}{2} \rightarrow 12 : 85$$

## Dividing a Quantity into a Given Ratio

5. The ratio of two complementary angles is 3:7. Find the measures of both angles.  $\hookrightarrow = 90$

$$3x + 7x = 90$$

$$10x = 90$$

$$x = 9$$

$$3(9) = 27^\circ$$

$$7(9) = 63^\circ$$

$$27 + 63 = 90^\circ \checkmark$$

6. The ratio of two supplementary angles is 4:1. Find the measures of both angles.  $\hookrightarrow = 180$

$$4x + 1x = 180$$

$$5x = 180$$

$$x = 36$$

$$4(36) = 144^\circ$$

$$144 + 36 = 180^\circ \checkmark$$

$$1(36) = 36^\circ$$

7. Members of the school band are buying tulips and pots of daffodils to sell at their fundraiser. They plan to buy 120 pots of flowers. The ratio  $\frac{\# \text{ of tulip pots}}{\# \text{ of daffodil pots}}$  will be  $\frac{2}{3}$ . How many pots of each type of flower should they buy?

$$2x + 3x = 120$$

$$5x = 120$$

$$x = 24$$

$$2(24) = 48 \text{ tulip pots}$$

$$3(24) = 72 \text{ daffodil pots}$$

$$\begin{array}{r} 48 \\ +72 \\ \hline 120 \checkmark \end{array}$$

8. The sides of a rectangle are in the ratio 2:5. The perimeter of the rectangle is 70cm. What is the width of the rectangle?

$$2l + 2w = P$$

$$2(2x) + 2(5x) = 70$$

$$4x + 10x = 70$$

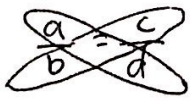
$$14x = 70$$

$$x = 5$$

$$2(5) = 10 \text{ cm length}$$

$$5(5) = 25 \text{ cm width}$$

# What is a PROPORTION?

- An equation that states two ratios are equal
- A proportion is written as  $\frac{a}{b} = \frac{c}{d}$  
- **Cross Product Property:** For any proportion,  $a \cdot d = b \cdot c$

Examples: Solve each proportion using the Cross Product Property.

9.  ~~$\frac{4}{x} = \frac{2}{7}$~~   $2x = 28$   
 $X = 14$

10.  ~~$\frac{x-1}{6} = \frac{13}{19}$~~   $6(13) = 19(x-1)$   
 $78 = 19x - 19$   
 $+19 \quad +19$   
 $97 = 19x$   
 $\frac{97}{19} = \frac{19x}{19}$   
 $X = 5.1$

11.  ~~$\frac{x-20}{3} = \frac{x-11}{18}$~~   
 $3(x-11) = 18(x-20)$   
 $3x - 33 = 18x - 360$   
 ~~$-3x + 360$~~   ~~$-3x + 360$~~   
 $327 = 15x$   
 $\frac{327}{15} = \frac{15x}{15} \quad X = 21.8$

12. The ratio of the width to height of a window is 2:7. The width of the window is 3ft. Write and solve a proportion to find the height.

w  ~~$\frac{2}{7} = \frac{3}{x}$~~   $\frac{2x}{2} = \frac{21}{2}$   
X = 10.5 \text{ ft}

**Converting Units:** 1 yd = 3 feet; 1 ft = 12 in.      1km = 1000m ; 1 m = 100 cm

13.  $225 \text{ ft} = \frac{75}{3} \text{ yd}$

14.  $3 \text{ m} = \frac{300}{100} \text{ cm}$

$3(100) =$

15. The bonsai bald cypress tree is a small version of a full-size tree at 15 in. A Florida bald cypress tree called the Senator stands 118 ft. tall. What is the ratio of the height of the bonsai to the height of the Senator?

$118(12) = 1416 \text{ in}$

$\frac{b}{s} = \frac{15 \text{ in}}{1416} = \frac{5 \text{ in}}{472 \text{ in}}$

16. Write the ratio of the first measurement to the second.

Length of a tennis racket: 2ft 4in.  $\rightarrow 2(12) + 4 = 28 \text{ in}$   
 Length of a ping pong paddle 10 in.

$\frac{28}{10} = \frac{14 \text{ in}}{5 \text{ in}}$