Main Ideas/Questions	Notes	7.1

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.

$40:24 \rightarrow 5:3$ (÷8)

2. Flutes to clarinets

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

3. Trombones to trumpets.

16 to 40 $\rightarrow$ 2 to 5 (÷3)

4. Violins to total instruments.

$24:170 \rightarrow 12:85$ (÷2)

Dividing a Quantity into a Given Ratio

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

$3x + 7x = 90$

$10x = 90$

$x = 9$

$3(9) = 27°$

$7(9) = 63°$

$27 + 63 = 90$ ✓

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

$4x + 1x = 180$

$5x = 180$

$x = 36$

$4(36) = 144°$

$1(36) = 36°$

$144 + 36 = 180°$ ✓

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 $\frac{\#\ of\ tulip\ pots}{\#\ of\ dafodil\ pots}$ will be $\frac{2}{3}$. How many pots of each type of flower should they buy?

$2x + 3x = 120$

$5x = 120$

$x = 24$

$2(24) = 48$ tulip pots

$3(24) = 72$ daffodil pots

$48 + 72 = 120$ ✓

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?

$2l + 2w = P$

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

$4x + 10x = 70$

$14x = 70$

$x = 5$

$2(5) = 10$ cm length

$5(5) = 25$ 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. $\frac{x-1}{6} = \frac{13}{19}$

$6(13) = 19(x-1)$

$78 = 19x - 19$

$+19 \quad +19$

$\frac{97}{19} = \frac{19x}{19}$

$x = 5.1$

11. $\frac{x-20}{3} = \frac{x-11}{18}$

$3(x-11) = 18(x-20)$

$3x - 33 = 18x - 360$

$-3x + 360 \quad -3x + 360$

$\frac{327}{15} = \frac{15x}{15}$

$x = 21.8$

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.

$\frac{w}{h}: \frac{2}{7} = \frac{3}{x}$

$\frac{2x}{2} = \frac{21}{2}$

$x = 10.5$ ft

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

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

14. 3 m = 300 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?

$118(12) = 1416$ 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. $\rightarrow 2(12)+4 = 28$in

Length of a ping pong paddle 10 in.

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