Ratios and Proportions

1. FOOTBALL A tight end scored 6 touchdowns in 14 games. Find the ratio of touchdowns per game.

$$\frac{TD}{G} = \frac{6}{14} = \boxed{3 \text{ to } 7}$$

2. EDUCATION In a schedule of 6 classes, Marta has 2 elective classes. What is the ratio of elective to non-elective classes in Marta's schedule?

$$\frac{EL}{NEL} = \frac{2}{4} = \boxed{1 \text{ to } 2}$$

6 classes − 2 elective = 4 non-elective classes

3. BIOLOGY Out of 274 listed species of birds in the United States, 78 species made the endangered list. Find the ratio of endangered species of birds to listed species in the United States.

$$\frac{END}{LIST} = \frac{78}{274} \qquad \boxed{39 \text{ to } 137}$$

4. BOARD GAMES Myra is playing a board game. After 12 turns, Myra has landed on a blue space 3 times. If the game will last for 100 turns, predict how many times Myra will land on a blue space.

$$\frac{TURNS}{BLUEsp} = \frac{12}{3} = \frac{100}{x} \qquad \frac{12x}{12} = \frac{300}{12} \qquad x = \boxed{25 \text{ times}}$$

5. SCHOOL The ratio of male students to female students in the drama club at Campbell High School is 3:4. If the number of male students in the club is 18, predict the number of female students?

$$\frac{male}{female} = \frac{3}{4} = \frac{18}{x} \qquad \begin{array}{l} 3x = 4(18) \\ 3x = 72 \end{array} \qquad x = \boxed{24 \text{ females}}$$

Solve each proportion.

6. $\frac{2}{5} = \frac{x}{40}$ $5x = 80$ $\boxed{x = 16}$

7. $\frac{7}{10} = \frac{21}{x}$ $7x = 210$ $\boxed{x = 30}$

8. $\frac{20}{5} = \frac{4x}{6}$ $20x = 120$ $\boxed{x = 6}$

9. $\frac{5x}{4} = \frac{35}{8}$ $40x = 140$ $\boxed{x = 35}$

10. $\frac{x+1}{3} = \frac{7}{2}$ $2x + 2 = 21$ $2(x+1) = 21$ $\boxed{x = 9.5}$

11. $\frac{15}{3} = \frac{x-3}{5}$ $3(x-3) = 5(15)$ $3x - 9 = 75$ $3x = 84$ $\boxed{x = 28}$

12. The ratio of the measures of the <u>sides</u> of a triangle is <u>3:5:7</u>, and its perimeter is 450 centimeters. Find the measures of each side of the triangle.

$3x + 5x + 7x = 450 \Rightarrow 15x = 450$ $x = 30$ ∴ $3(30) : 5(30) : 7(30)$ $\boxed{90 : 150 : 210}$

13. The ratio of the measures of the sides of a triangle is 5:6:9, and its perimeter is 220 meters. What are the measures of the sides of the triangle?

$5x + 6x + 9x = 220$ $20x = 220$ $x = 11$ $5(11) : 6(11) : 9(11)$ $\boxed{55 : 66 : 99}$

14. The ratio of the measures of the <u>sides</u> of a triangle is 4:6:8, and its perimeter is 126 feet. What are the measures of the sides of the triangle?

$4x + 6x + 8x = 126$ $18x = 126$ $x = 7$ $4(7) : 6(7) : 8(7)$ $\boxed{28 : 42 : 56}$

15. The ratio of the measures of the <u>sides</u> of a triangle is 5:7:8, and its perimeter is 40 inches. Find the measures of each side of the triangle.

$5x + 7x + 8x = 40$ $20x = 40$ $x = 2$ $5(2) : 7(2) : 8(2)$ $\boxed{10 : 14 : 16}$