Section 6.2 – Ratios and Proportions

A _____ is a comparison of two quantities. The ratio of quantity **a** to quantity **b** is most commonly represented as a fraction $\dfrac{a}{b}$. The ratio can also be represented as **a:b** or **a to b.** Ratios are usually expressed in simplified form. For example, the ratio $\dfrac{5}{10}$ or **5:10** is usually simplified as $\dfrac{1}{2}$ or **1:2**.

Ex 1:

a) The <u>perimeter</u> of a rectangle is 40 feet. The ratio of the width to the length is 2:3. Find the length and the width.

b) The <u>area</u> of a rectangle is $108\,\text{cm}^2$. The ratio of the width to the length is 3:4. Find the length and the width.

Ex 2:

a) The measures of the angles in a triangle are in the extended ratio of 3:4:8. Find the measures of the angles.

b) The measures of the angle is a triangle are in the extended ratio of 1:4:7. Find the measures of the angles.

The equality of two ratios is called a _____. For example, if the ratio $\dfrac{a}{b}$ is equal to the ratio $\dfrac{c}{d}$, then the following proportion $\dfrac{a}{b} = \dfrac{c}{d}$ can be written.

Ex 3:

Solve the proportions.

Important Note: The first step in solving a proportion is to _____.

Tip: Proportions can be made easier to solve by first simplifying the ratios.
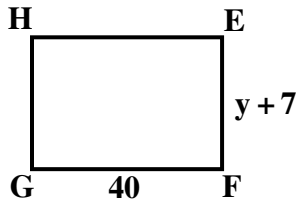
a) $\dfrac{9}{15} = \dfrac{6}{x}$ **b)** $\dfrac{4}{y-3} = \dfrac{8}{y}$ **c)** $\dfrac{s-5}{4} = \dfrac{s}{10}$
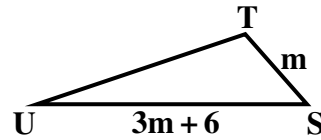
Ex 4:
The ratio of two sides lengths is given. Solve for the variable.

a. EF:FG is 4:5

H   E

y + 7

G   40   F

b. SU:ST is 4:1

T

m

U   3m + 6   S

Ex 5:
Two gears, Gear A and Gear B, have a gear ratio of 1:3. If Gear B has 24 teeth, then how many teeth does Gear A have?

Ex 6:
The ratio of the corresponding side lengths of ΔQRS to ΔVTU is 3:1.
Find the unknown lengths of both triangles.

T ___4 cm___ U

3 cm

V

Q

15 cm

R

S