LEARNING TARGETS

- ✓ I can use ratios to find dimensions.
- ✓ I can use extended ratios to solve problems.
- ✓ I can use proportions to solve problems.
- ✓ I can use a scale drawing to solve problems.

✓ I can use a ratio to find a dimension.

You are painting some barn doors. You know that the perimeter of the doors is 64 feet and that the ratio of the length to height is 3:5. Find the area of the doors.

a) Step 1: Write equivalent ratio

$$\text{length: height}$$
$$3x : 5x$$

b) Step 2: Set up and solve equation to find x.

$$10x + 6x = 64$$
$$16x = 64 \Rightarrow \boxed{x = 4}$$

c) Step 3: Evaluate the equivalent expressions for length and width.
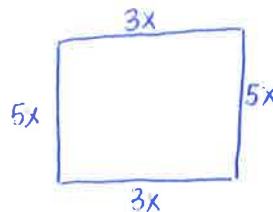
$$\ell = 3x = 3(4) = 12 \text{ ft}$$
$$h = 5x = 5(4) = 20 \text{ ft}$$

d) Step 4: Answer the question – find area!

$$A = \ell h$$
$$= (12)(20)$$
$$\boxed{A = 240 \text{ ft}^2}$$

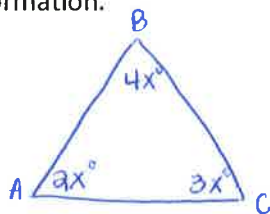## ✓ I can use extended ratios to solve problems.

An extended ratio compares more than 2 items.

a) The measures of the angles in $\triangle ABC$ are in the extended ratio of 2:3:4. Find the measures of the angles.

Step 1: Write an equivalent ratio for the given ratio.

$$2x : 3x : 4x$$

Step 2: Draw and label a diagram using the given information.

The three angles of a triangle have a sum of 180°!

Step 3: Set up and solve an equation to find x.

$$4x + 3x + 2x = 180$$
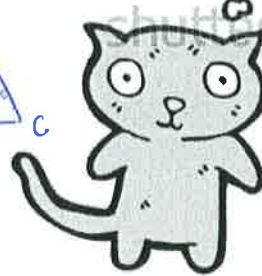$$9x = 180$$
$$\boxed{x = 20}$$

Step 4: Answer the question!
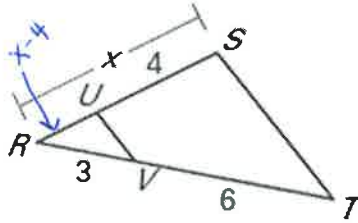
$$m\angle A = 2(20) = 40°$$
$$m\angle B = 4(20) = 80°$$
$$m\angle C = 3(20) = 60°$$

Check: $40 + 80 + 60$
$$= 180° ✓$$

✓ I can use proportions to solve problems.

a) In the diagram below, $\dfrac{RU}{US} = \dfrac{RV}{VT}$. Find x.

$$\frac{x-4}{4} = \frac{3}{6}$$

$12 = 6(x-4)$

$12 = 6x - 24$

$36 = 6x$

$\boxed{x = 6}$

$RU = 6-4$

$\boxed{RU = 2}$

b) As part of a science project, you need to estimate the number of blue spruce trees in a 50 acre forest. You count 36 trees in 3 acres and notice that the trees seem to be evenly distributed. Estimate the total number of blue spruce trees in the forest.

Step 1: Write and solve a proportion involving two ratios that compare the two quantities (in this case the number of trees and the number of acres).

$$\frac{trees}{acres} : \quad \frac{36}{3} = \frac{x}{50}$$

$3x = 1800$

$\boxed{x = 600}$

Step 2: Answer the question!

There would be about 600 blue spruce trees in the 50 acre forest

✓ I can use scale drawings to solve problems.

A **scale** is a ratio that describes how the dimensions in a drawing are related to the actual dimensions of the object. $scale = \dfrac{dimension\ in\ drawing}{actual\ dimension}$

a) The blueprint below shows a scale drawing of an MP3 music player. The diameter of the round speaker on the blueprint is 0.4 inch. The actual length is 1.6 inches. What is the scale of the blueprint?

$$scale = \frac{drawing}{actual} = \frac{0.4\ in}{1.6\ in} = 0.25 = \frac{1}{4}$$

$$\boxed{Scale = 1:4}$$
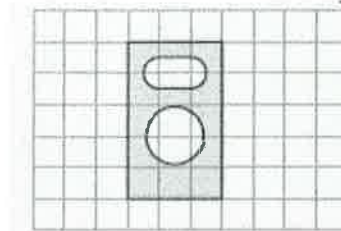
b) The scale of a map is 1in : 1440 ft. Find the actual length of the street if the distance on the map is 3 inches.

$$\frac{drawing}{actual} = \frac{1in}{1440ft} = \frac{3in}{x}$$

$x = 1440(3)$

$x = 4,320\ ft$

The actual length of the street is 4,320 ft