Unit 5: Proportional Reasoning Lesson 5.2

Coach's Corner – III

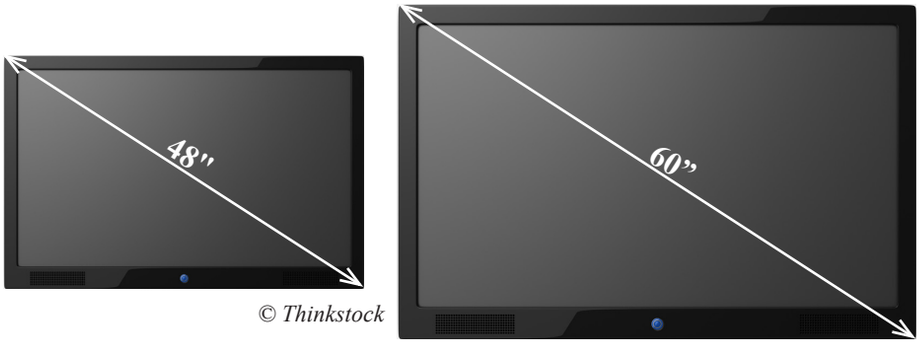
1. Determine the scale factor of a miniature version of the CFL Grey Cup with a chalice height of 3 inches if the original cup's chalice height is 13 inches. State the scale factor to the nearest tenth of a percent.

$$\text{scale factor} = \frac{\text{miniature}}{\text{original}}$$
$$\text{scale factor} = \frac{3}{13}$$
$$\text{scale factor} = 0.2307...$$

The scale factor is 0.2307….
The scale factor is 23.1%.

2. Taylor bought a 48" LED TV that has a height of 2 feet. Adam bought a 60" LED TV.

   a. To the nearest inch, what is the height of Adam's TV?



Determine the scale factor	**Convert 2 feet to inches (1 foot = 12 inches)**	
$k = \frac{\text{scale TV}}{\text{original TV}}$	$\frac{x}{2\text{ ft}} = \frac{12\text{ in}}{1\text{ ft}}$	$k = \frac{\text{scale TV height}}{\text{original TV height}}$
$k = \frac{60\text{ in}}{48\text{ in}}$	$1x = 12 \times 2$	$1.25 = \frac{h}{24}$
$k = \frac{5}{4}$ or $k = 1.25$	$x = 24\text{ in}$	$1.25 \times 24 = h$
		$30 = h$

The height of Adam's 60" LED TV is 30".

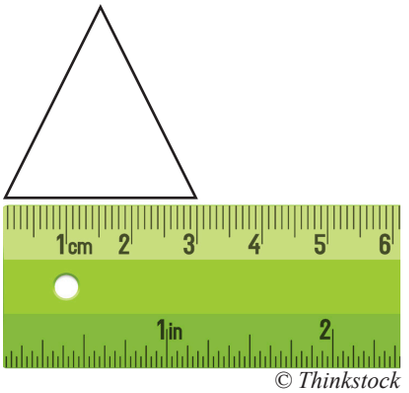
b. Using Pythgorean's theorem ($a^2 + b^2 = c^2$), determine the width of Adam's 60" LED TV.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 30^2 + b^2 &= 60^2 \\ 30^2 - 30^2 + b^2 &= 60^2 - 30^2 \\ b^2 &= 60^2 - 30^2 \\ b &= \sqrt{60^2 - 30^2} \\ b &= \sqrt{3600 - 900} \\ b &= \sqrt{2700} \\ b &\doteq 51.96 \end{aligned}$$

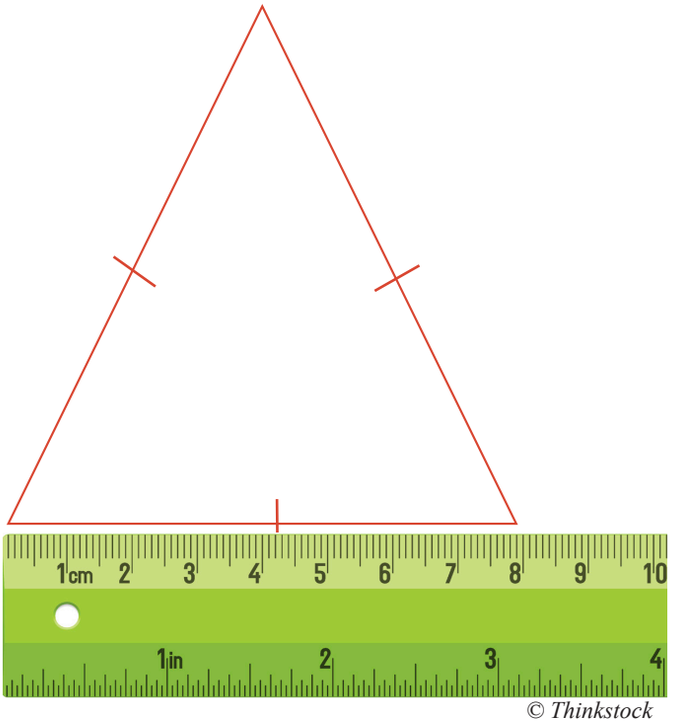
The width of Adam's 60" LED TV is approximately 52".

3. Draw an enlargement, with a scale factor of $\frac{8}{3}$, of an equilateral triangle with side length 3 cm.

The original equilateral triangle has sides measuring 3 cm. Determine the side lengths of the enlargement.



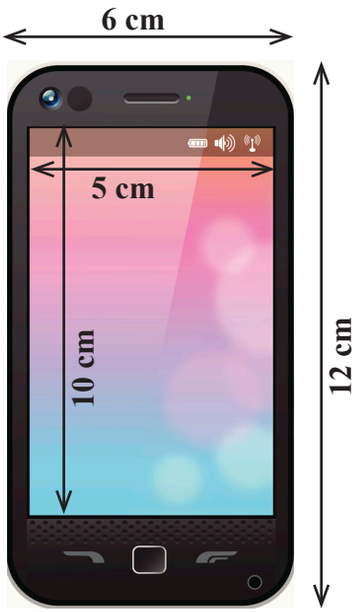
$$\begin{aligned} k &= \frac{\text{scale diagram}}{\text{original}} \\ \frac{8}{3} &= \frac{\text{scale diagram}}{3\text{ cm}} \\ \frac{8 \cdot 3\text{ cm}}{3} &= \text{scale diagram} \\ 8\text{ cm} &= \text{scale diagram} \end{aligned}$$



Each side of the enlarged triangle will have a length of 8 cm.

4. Draw a scale diagram of this cellular phone using a scale factor of 0.75.

Phone length:	**Phone width:**
$k = \frac{\text{scale length}}{\text{original}}$	$k = \frac{\text{scale width}}{\text{original}}$
$0.75 = \frac{\text{scale length}}{12\text{ cm}}$	$0.75 = \frac{\text{scale width}}{6\text{ cm}}$
$0.75 \times 12\text{ cm} = \text{scale length}$	$0.75 \times 6\text{ cm} = \text{scale width}$
$9\text{ cm} = \text{scale length}$	$4.5\text{ cm} = \text{scale width}$
Screen length:	**Screen width:**
$k = \frac{\text{scale screen length}}{\text{original}}$	$k = \frac{\text{scale screen width}}{\text{original}}$
$0.75 = \frac{\text{scale screen length}}{10\text{ cm}}$	$0.75 = \frac{\text{scale screen width}}{5\text{ cm}}$
$0.75 \times 10\text{ cm} = \text{scale screen length}$	$0.75 \times 5\text{ cm} = \text{scale screen width}$
$7.5\text{ cm} = \text{scale screen length}$	$3.75\text{ cm} = \text{scale screen width}$



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Scale drawing:

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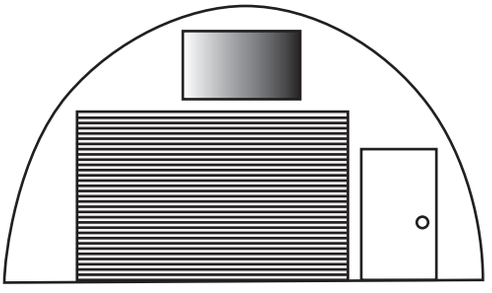
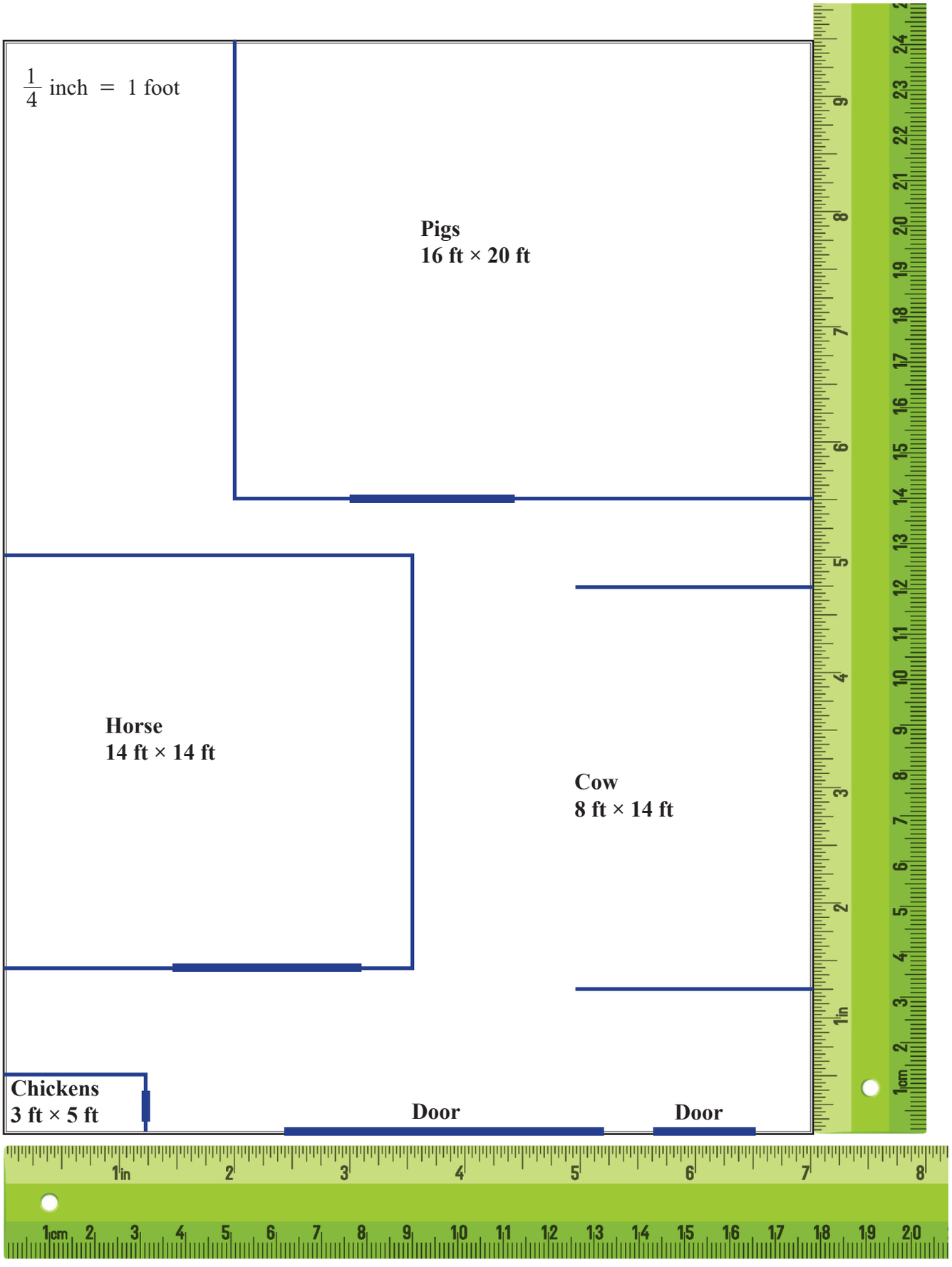
5. Create a scale diagram of the floor plan of a quonset hut that will have enough room to comfortably house a horse, a mother pig, and 12 piglets, a dairy cow, and a chicken coop with 6 chickens. The following table outlines the space requirements of each type of animal. Note that there should be at least two feet of space between each animal enclosure. The door side of the quonset hut should be clear of any enclosures for easy entry and exit.



	Measurments
Quonset hut	**28 ft × 38 ft**
Horse enclosure	**14 ft × 14 ft**
Pig and 12 piglets enclosure	**16 ft × 20 ft**
Cow open-sided enclosure	**8 ft × 14 ft**
Chicken coop with 6 chickens	**3 ft × 5 ft**

Use a scale of $\frac{1}{4}$ inch = 1 foot.

Key: Student Scale Diagrams will vary. There is an example on the following page.



Please complete *Lesson 5.2 Game On!* located in *Workbook 5A* before proceeding to *Lesson 5.3*.