

### Example 1 Determine Imperial Distances

The photograph shows a polar bear near Churchill, MB. The scale of the photograph is 1:24.



- Calculate the height of the bear's back, to the nearest inch.
- What is the length of the bear? State your answer in feet and whole inches.

### Example 2 Apply Linear Measurement

The Carsons want to buy a 32" television. The size of a television is measured across the screen diagonally. They are choosing between a standard 4:3 television set and a widescreen 16:9 HDTV. To help them decide, calculate the screen dimensions and the viewing area for each television. Which television has the greater viewing area?

### Example 3 Solve a Problem Using Imperial Measurements

Alashun wants to make a drum, or gilaut, that resembles the one used by a drum dancer in Iqaluit, NU. He has a circular frame, over which to stretch caribou skin. Then, he will lash it into place along the frame with sinew. Alashun uses  $3\frac{1}{2}$  in. of sinew for each inch of the frame.

- Estimate the diameter of the drum frame in imperial units. The scale of the photo is 1:15.
- Approximately what length of sinew does Alashun need to make the drum? State your answer in yards and inches.

### 1.2 Imperial Measurement

1. a) diagram height = 2 inches.

$$\frac{1}{24} = \frac{x}{2} \quad \text{Cross Multiply} \quad \frac{24 \cdot 2}{1} = \frac{x}{1} = 48 = 48$$

b) length =  $3\frac{3}{8} \rightarrow \frac{27}{8}$

$$\frac{1}{24} = \frac{27/8}{x} \quad 3 \cdot \frac{27}{8} \times \frac{24}{1} = 81 \text{ inches} = 6'9''$$

2. 4:3.  $1.33:1$   $32''$  diagonal  $16:9 \rightarrow 1.77:1$

$$a^2 + b^2 = c^2 \quad 1.33x \quad 32 \quad 1x \quad a^2 + b^2 = c^2 \quad x \quad 32 \quad 1.77x$$

$$(1.33x)^2 + x^2 = 32^2 \quad (1.77x)^2 + x^2 = 32^2$$

$$1.7x^2 + x^2 = 1024$$

$$3.2x^2 + x^2 = 1024$$

$$\frac{2.7x^2}{2.7} = \frac{1024}{2.7}$$

$$\frac{4.2x^2}{4.2} = \frac{1024}{4.2}$$

$$\sqrt{x^2} = \sqrt{368.64}$$

$$\sqrt{x^2} = \sqrt{246.1}$$

$$x = 19.2$$

$$x = 15.7 \text{ in}$$

$$l = 19.2 \text{ in} \quad h = 25.6$$

$$l = 15.7 \quad h = 27.89$$

$$A = lh \rightarrow 19.2 \times 25.6$$

$$A = lw \rightarrow (15.7)(27.89)$$

$$= 491.52 \text{ in}^2$$

$$= 437.55 \text{ in}^2$$

The standard 4:3 tv has the larger area.

3.  $C = \pi d$

$$47.12 \text{ in} \times 3.5 \text{ in}$$

$$C = \pi 15.$$

$$= 165 \text{ inches} \div 36$$

$$C = 47.12 \text{ in}$$

$$4 \text{ yds } 21 \text{ inches}$$

