

When working with area and scale factors we must remember that scale factors are applied to both the length and the width of the original shape. As a result, when determining the area of the original shape given the area of the scale diagram we must include two scale factors.

Example 1: Jasmine is making a kite from a 2:25 scale diagram. The area of the scale diagram is 20 cm^2 . How much fabric will she need for her kite?

$$\begin{aligned} \text{Area of Kite} &= k^2 (\text{Area of Scale Diagram}) & | & \quad k = \frac{25}{2} = 12.5 \\ &= 12.5^2 (20) \\ &= 3125 \end{aligned}$$

Example 2: Jim's laptop has a monitor with the dimensions 10 in by 12 in. The image on his laptop is projected onto the screen of a whiteboard. According to the documentation for the whiteboard, its screen area is 2836.6875 in^2 . Determine the scale factor used to project the images on the laptop to the whiteboard.

$$\begin{aligned} \text{Area of whiteboard} &= k^2 (\text{Area of Scale Diagram}) & \leftarrow (10)(12) = 120 \\ 2836.6875 &= k^2 (120) \\ \frac{2836.6875}{120} &= \frac{k^2 (120)}{120} \\ \sqrt{23.64} &= \sqrt{k^2} \\ 4.9 &= k \end{aligned}$$

Example 3: Determine the dimensions of the whiteboard in example 2.

