

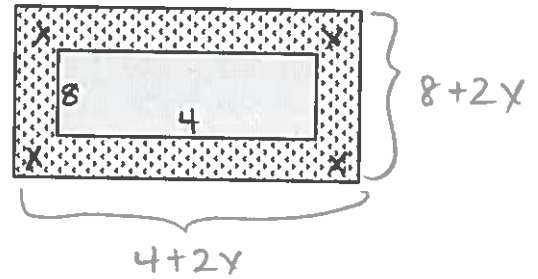
KEY

QUADRATIC WORD PROBLEMS

Solving Quadratic Equations

Example 1

A rectangular lawn measuring 8 m by 4 m is surrounded by a flower bed of uniform width. The combined area of the lawn and the flower bed is 165 m^2 . What is the width of the flower bed?



$$(4 + 2x)(8 + 2x) = 165$$

$$\begin{array}{r} 32 + 24x + 4x^2 = 165 \\ -165 \qquad \qquad -165 \\ \hline 4x^2 + 24x - 133 = 0 \end{array}$$

$$4x^2 + 24x - 133 = 0$$

$$x = \frac{-24 \pm \sqrt{(24)^2 - 4(4)(-133)}}{2(4)}$$

$$x = \frac{-24 \pm \sqrt{2704}}{8}$$

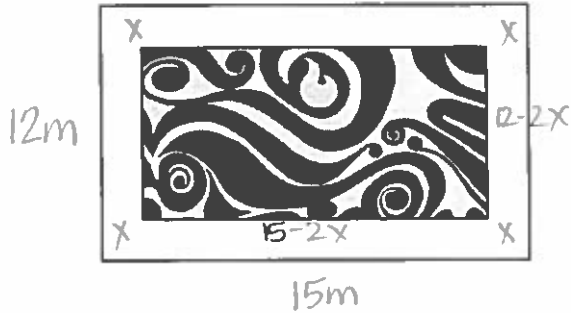
$$x = \frac{-24 \pm 52}{8}$$

$$x = \frac{-24 + 52}{8} = 3.5$$

$$x = \frac{-24 - 52}{8} = -9.5 \text{ reject}$$

KEY

Example 2



A mural is to be painted on a wall that is 15 m long and 12 m high. A border of uniform width is to surround the mural. If the mural is to cover 75% of the area of the wall, how wide must the border be, to the nearest tenth of a metre?

$$A = LW$$

$$(12-2x)(15-2x) = 135$$

$$\begin{array}{r} 180 - 54x + 4x^2 = 135 \\ -135 \\ \hline 4x^2 - 54x + 45 = 0 \end{array}$$

$$\begin{array}{l} A = 12 \cdot 15 \\ A = 180 \text{ meters}^2 \\ \times .75 \end{array}$$

$$135 \text{ meters}^2 \rightarrow \text{for mural}$$

$$4x^2 - 54x + 45 = 0$$

$$x = \frac{54 \pm \sqrt{(-54)^2 - 4(4)(45)}}{2(4)}$$

$$x = \frac{54 \pm \sqrt{2196}}{8}$$

$$x = \frac{54 + \sqrt{2196}}{8}$$

$$x = \frac{54 - \sqrt{2196}}{8}$$

$$x = 12.6$$

reject
(too big)
wall's only
12 m high

$$x = .9 \text{ Metre}$$

Homework

Page 404-407 #19, 24-28