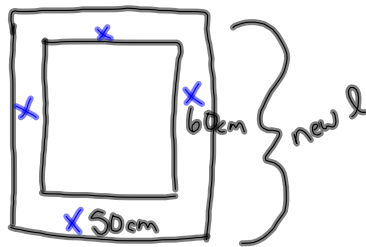


## Quadratic Story Problems

↳ Similar stories to max/min, but now we are looking for the solutions to  $x$ , not the vertex.

Factor or Quadratic Formula!

example 1: pg 252 Area Type



$$A = lw \Rightarrow 3000 \text{ cm}^2$$

$$(\text{new } l)(\text{new } w) = \text{new Area}$$

$$(2x+60)(2x+50) = 6000$$

$$4x^2 + 100x + 120x + 3000 - 6000 = 0$$

$$4x^2 + 220x - 3000 = 0$$

or

$$x^2 + 55x - 750 = 0$$

$$x = \frac{-55 \pm \sqrt{55^2 - 4(1)(-750)}}{2(1)}$$

$$x = \frac{-55 \pm \sqrt{6025}}{2}$$

$$x = \frac{-55 \pm 77.6}{2} \rightarrow \begin{aligned} &\frac{-55 + 77.6}{2} = 11.3 \\ &\frac{-55 - 77.6}{2} = -66.3 \end{aligned}$$

$$\boxed{\text{width} = 11.3 \text{ cm}}$$

- 2) Karen's rectangular flower bed measures 10m by 15m. She plans to double its area by adding a strip of uniform width around the flower bed. Determine the width of the strip.

$$(2x+15)(2x+10)=300$$

$$4x^2+20x+30x+150-300=0$$

$$4x^2+50x-150=0$$

or

$$2x^2+25-75=0$$

$$(2x-5)(x+15)=0$$

$$x = \frac{5}{2} \quad \left\{ \quad x = -15 \right.$$

$$x = 2.5$$

3. A rectangular picture measuring 20cm by 40cm is to be matted with a border of uniform width. If the border is to be exactly half the area of the picture, determine the border's width.

$$(\text{new } l)(\text{new } w) = \text{new Area}$$

$$(2x+40)(2x+20) = 1200$$

$$\text{ans} = 3\text{cm}$$



4. A field measuring 120m by 50m.  
John begins mowing from the outside perimeter of the field until he has mowed half the field. How wide is the border he has mowed?

