

Before we begin, are there any questions from last day's work **3.5.1**  
and **#2**

## Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) solve problems algebraically that involve polynomial functions & equations arising from real-world applications

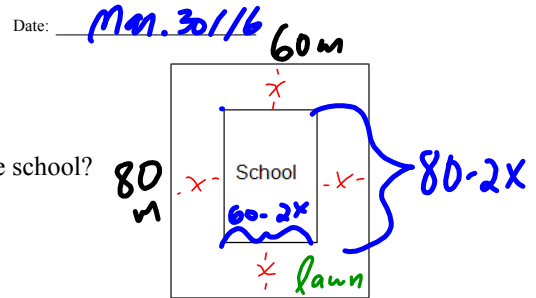
## 3.6.1 Applications of Polynomial Equations

1. A school is to be built on a rectangular lot measuring 80 m by 60 m.

A lawn of uniform width is to surround the school.

The area of the lawn is equal to the area of the school.

How wide will the strip of lawn be AND what are the dimensions of the school?



## Solution

Let  $x$  represent the width of the lawn, in m.

Let  $80-2x$  represent the length of the school, in m.

Let  $60-2x$  represent the width of the school, in m.

$$A_{\text{SCHOOL}} = (80-2x)(60-2x)$$

$$2400 = 4800 - 160x - 120x + 4x^2$$

$$0 = 4x^2 - 280x + 4800 - 2400$$

$$0 = 4x^2 - 280x + 2400$$

$$= 4(x^2 - 70x + 600)$$

$$= 4(x-60)(x-10)$$

$$x = 60 \quad \text{or} \quad x = 10$$

$\downarrow$   
inadmissible

$$\hookrightarrow l = 80 - 2x \quad ; \quad w = 60 - 2x$$

$$= 80 - 2(10)$$

$$= 80 - 20$$

$$= 60$$

$$= 60 - 2(10)$$

$$= 60 - 20$$

$$= 40$$

$\therefore$  the width of the strip of lawn is 10 m,

and the dimensions of the school are 60 m x 40 m.

$$A_{\text{SCHOOL}} = A_{\text{LAWN}}$$

$$2400 = 2400$$

$$A_{\text{LOT}} = 80 \times 60$$

$$= 4800 \text{ m}^2$$

$$A_{\text{SCHOOL}} = \frac{1}{2} A_{\text{LOT}}$$

$$= \frac{1}{2} (4800)$$

$$= 2400$$