

Before we begin, are there any questions from last day's work?

From 2 days ago: 6.5_1 (Day 1) pp. 300-301 #3bce, 4c, 6, 9bd

Solutions posted on website! p. 300 (top) #C2

(With additional example)

From Last day: pp. 312-313 #4, 5, 6, 9, 11, 13

Enrichment: pp. 455-457 #39, 41, 54, 53a

Return SWYK 6.1: ~~Completing the Square~~
Done Fall 2016
Solutions on next slide

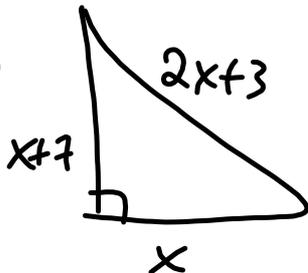
Do 3-minute WARM-UP**Today's Learning Goal(s):**

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

- a) recognize when a problem can be modelled by a quadratic *relation*.
- b) solve problems involving quadratic *relations* and quadratic equations.

p. 312

#6



$$x^2 + (x+7)^2 = (2x+3)^2$$

$$x^2 + x^2 + 14x + 49 = 4x^2 + 12x + 9$$

$$2x^2 + 14x + 49 = 4x^2 + 12x + 9$$

$$0 = \underline{4x^2 - 2x^2} + \underline{12x - 14x} + \underline{9 - 49}$$

$$0 = 2x^2 - 2x - 40$$

$$= 2(x^2 - x - 20)$$

$$= 2(x-5)(x+4)$$

$$\therefore x = 5 \text{ or } x = -4$$

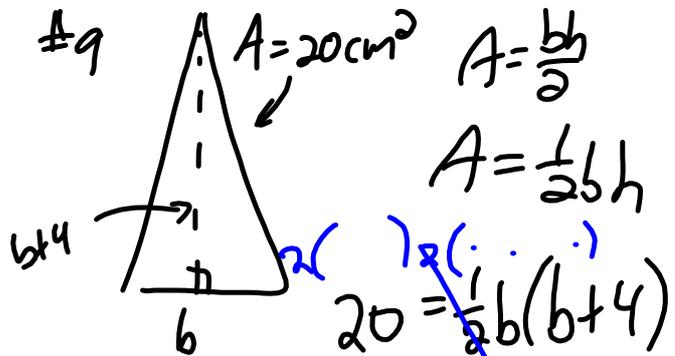
inadmissible

$$x=5 \quad x+7 \quad 2x+3$$

$$= 12 \quad = 13$$

\therefore the triangle's lengths are 5 cm, 12 cm & 13 cm.

#9



$$20 = \frac{1}{2}b(b+4)$$

$$40 = b(b+4)$$

$$40 = b^2 + 4b$$

$$0 = b^2 + 4b - 40$$

$$a=1 \quad b=4 \quad c=-40$$

$$b = \frac{-4 \pm \sqrt{4^2 - 4(1)(-40)}}{2(1)}$$

$$= \frac{-4 \pm \sqrt{16 + 160}}{2}$$

$$= \frac{-4 \pm \sqrt{176}}{2}$$

$$b = \frac{-4 + \sqrt{176}}{2} \text{ or } b = \frac{-4 - \sqrt{176}}{2}$$

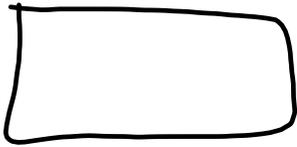
$$\approx 4.63 \text{ cm}$$

$$\therefore b = 46.3 \text{ mm}$$

$$\approx -8.63$$

inadmissible

p.312 #11



$$A = 33 \text{ cm}^2 \quad P = 23 \text{ cm}$$

$$33 = lw \quad 23 = 2l + 2w$$

$$33 = l(11.5 - l) \quad 23 - 2l = 2w$$

$$33 = 11.5l - l^2$$

$$l^2 - 11.5l + 33 = 0$$

$$l = \frac{-(-11.5) \pm \sqrt{(-11.5)^2 - 4(1)(33)}}{2(1)}$$

$$= \frac{11.5 \pm \sqrt{132.25 - 132}}{2}$$

$$= \frac{11.5 \pm \sqrt{0.25}}{2}$$

$$= \frac{11.5 \pm 0.5}{2}$$

$$= \frac{11.5 + 0.5}{2} \quad \text{or} \quad \frac{11.5 - 0.5}{2}$$

$$= \frac{12}{2}$$

$$= 6$$

$$\text{if } l = 6$$

$$w = 11.5 - l$$

$$= 11.5 - 6$$

$$= 5.5 \text{ cm}$$

$$= \frac{11}{2}$$

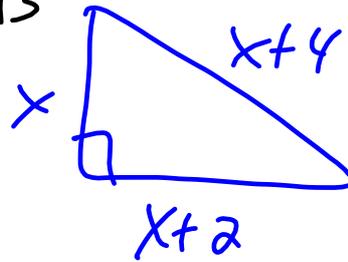
$$= 5.5$$

$$\text{if } l = 5.5$$

$$w = 11.5 - 5.5$$

$$= 6 \text{ cm}$$

p.313 #13



$$x^2 + (x+2)^2 = (x+4)^2$$

$$x^2 + x^2 + 4x + 4 = x^2 + 8x + 16$$

$$2x^2 - x^2 + 4x - 8x + 4 - 16 = 0$$

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

$$\therefore x = 0 \text{ or } x = -2$$

inadmissible.

\therefore the lengths are 6 cm, 8 cm + 10 cm.

3-minute WARM-UP:Solve for x : $3x^2 + 2x = 5$

$$3x^2 + 2x - 5 = 0$$

$$a = 3 \quad b = 2 \quad c = -5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(2) \pm \sqrt{(2)^2 - 4(3)(-5)}}{2(3)}$$

$$= \frac{-2 \pm \sqrt{4 + 60}}{6}$$

$$= \frac{-2 \pm \sqrt{64}}{6}$$

$$= \frac{-2 \pm 8}{6}$$

$$x = \frac{-2 + 8}{6} \quad \text{or} \quad x = \frac{-2 - 8}{6}$$

$$= \frac{6}{6}$$

$$= 1$$

$$= \frac{-10}{6}$$

$$= -\frac{5}{3}$$

$$\downarrow$$

$$(3x + 5)(x - 1) = 0$$

$$3x + 5 = 0$$

$$3x = -5$$

$$x = -\frac{5}{3}$$

$$x - 1 = 0$$

$$x = 1$$

MPM 2DI

6.5 Solve Problems Using Quadratic Equations (Day2)

Date: _____

"Word Problems" (Day Two)

Ex. 1

A rectangular park measures 400 m by 200 m.

Dan is mowing the field in a spiral pattern, starting from the outside and working in towards the center. After an hour of work, 75% of the field is left uncut.

What is the size of the ring cut around the outside, to the nearest hundredth of a metre?

(Include a diagram.)

✚ Let x represent the width of the ring of the cut grass, in m.

$$\begin{aligned}\text{✚ Area}_{\text{field}} &= 400 \times 200 \\ &= 80\,000 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{✚ Area}_{\text{uncut}} &= 0.75 \times 80\,000 \\ &= 60\,000 \text{ m}^2\end{aligned}$$

$$\text{✚ Area}_{\text{uncut}} = (400-2x)(200-2x)$$

$$= 80\,000 - 800x - 400x + 4x^2$$

$$60\,000 = 4x^2 - 1200x + 80\,000$$

$$0 = 4x^2 - 1200x + 80\,000 - 60\,000$$

$$0 = 4x^2 - 1200x + 20\,000$$

$$= 4(x^2 - 300x + 5000)$$

$$a = 1 \quad b = -300 \quad c = 5000$$

$$x = \frac{-(-300) \pm \sqrt{(-300)^2 - 4(1)(5000)}}{2(1)}$$

$$= \frac{300 \pm \sqrt{90000 - 20000}}{2}$$

$$= \frac{300 \pm \sqrt{70000}}{2}$$

$$x = \frac{300 + \sqrt{70000}}{2} \quad \text{or} \quad x = \frac{300 - \sqrt{70000}}{2}$$

$$= 282.287$$

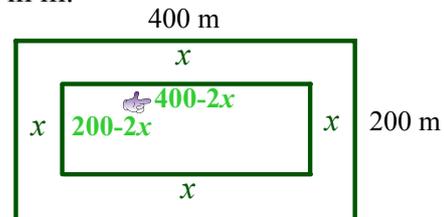
$$= 17.712$$

$$= 282.29 \text{ m}$$

$$= 17.71$$

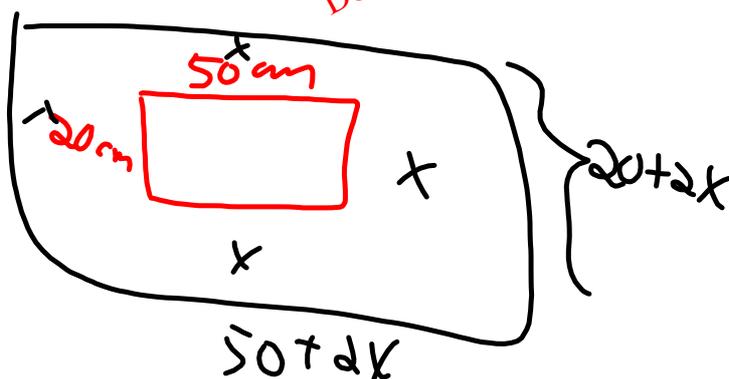
inadmissible
(too big)

\therefore the width of the ring is 17.71 m.



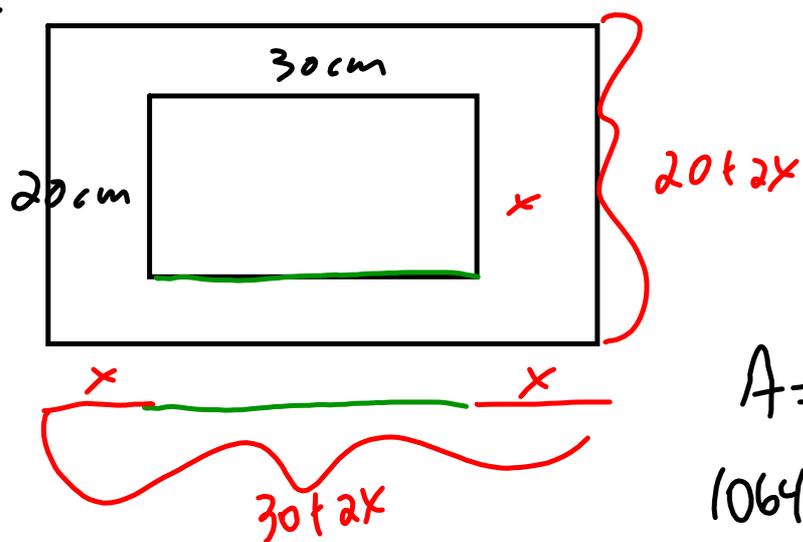
Today's entertainment: **READ** p. 307 **Example 2** Width of a Path
pp. 313-314 #18, 19, 21, 22
Enrichment: pp. 452-453 #22, 30

Correct Unit 5 Summative?
Done Fall 2016



More? 

18.



$$A = (30 + 2x)(20 + 2x)$$

$$1064 =$$

Attachments

PopGoestheWeasel.mid