

Class #15 - Tues, Oct. 5

(1)

Last time:

- examples - "square root property"

for solving certain types of quadratic equations

WW, "SRP"

#1: $x^2 = 121$

#2: $(x-6)^2 = 36$

#3: $(x-4)^2 = 17$

$\Rightarrow \bullet x^2 = k \Rightarrow$ By SRP, $x = \pm\sqrt{k}$

$\bullet (x-h)^2 = k$

class
Fri Oct 1

office
hr.
yest.

\hookrightarrow let's do a similar example...

Solve: $(x+3)^2 = 48$

Ex: Solve for x:

(2)

$$(x+3)^2 = 48$$

① Take the square root of both sides!

$$\sqrt{(x+3)^2} = \pm\sqrt{48} \quad \text{By SRP!}$$

$$\rightarrow x+3 = \pm\sqrt{48}$$

② Solve for x (and also simplify $\sqrt{48}$!).

$$\underline{\underline{x+3}} = \underline{\underline{\pm 4\sqrt{3}}}$$

subtract 3 from
both sides:

$$\boxed{x = -3 \pm 4\sqrt{3}}$$

$$\begin{aligned} \sqrt{48} &= \sqrt{16(3)} = \sqrt{16}\sqrt{3} \\ &\quad \uparrow \\ &16 \cdot 3 \qquad = 4\sqrt{3} \end{aligned}$$

~~Note~~
In general: $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$
But: $\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$
Ex: $\sqrt{x+4} \neq \sqrt{x} + \sqrt{4}$

WW, "SRP" #4

(3)

Solve for x: $(x - \frac{1}{2})^2 = \frac{5}{4}$

$$\sqrt{(x - \frac{1}{2})^2} = \pm \sqrt{\frac{5}{4}}$$

$$x - \frac{1}{2} = \pm \frac{\sqrt{5}}{2}$$
$$+ \frac{1}{2} \quad + \frac{1}{2}$$

$$x = \frac{1}{2} \pm \frac{\sqrt{5}}{2} = \frac{1 \pm \sqrt{5}}{2}$$

i.e., $x = \frac{1 + \sqrt{5}}{2}, x = \frac{1 - \sqrt{5}}{2}$

$$\sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{2}$$
$$\Rightarrow \sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{2}$$
$$= \frac{\sqrt{5}}{2}$$

Let's look at this graphically & Desmos...

We were given the equation

$$(x - \frac{1}{2})^2 = \frac{5}{4}$$

Let's put this quadratic equation in std form:

("FOIL" the LHS)

$$ax^2 + bx + c = 0$$

$$(x - \frac{1}{2})(x - \frac{1}{2}) = \frac{5}{4}$$

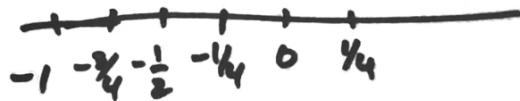
$$x^2 - \frac{1}{2}x - \frac{1}{2}x + \frac{1}{4} = \frac{5}{4}$$

$$x^2 - x + \frac{1}{4} = \frac{5}{4}$$

$$-\frac{5}{4} \quad -\frac{5}{4}$$

$$x^2 - x - 1 = 0$$

$$\frac{1}{4} - \frac{5}{4} = \frac{1-5}{4} = \frac{-4}{4} = -1$$



WebWork schedule

relevant
to
Exam

- "AC-Method", "Difference of Squares"
"Zero Product Property" - due tonight

- "Square Root Property" - due next Tues.

(but: do # 1-4)

relevant to Exam.

(# 5-9: "completing to square")

not on Exam -

we will cover in class thurs. → quadratic formula.