

Extracting Square Roots

- isolate the term that is squared
- take the square root of both sides
- solve

example: $\frac{2(x-3)^2}{2} = \frac{10}{2}$

$$(x-3)^2 = 5$$

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

$$\begin{array}{r} x-3 = \pm\sqrt{5} \\ +3 \quad +3 \\ \hline x = 3 \pm\sqrt{5} \end{array}$$

Sep 21-8:08 PM

example: $\frac{4(2x-1)^2}{4} = \frac{16}{4}$

$$(2x-1)^2 = 4$$

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

$$2x-1 = \pm 2$$

$$\begin{array}{r} 2x-1 = 2 \\ +1 \quad +1 \\ \hline 2x = 3 \\ x = \frac{3}{2} \end{array}$$

$$\begin{array}{r} 2x-1 = -2 \\ +1 \quad +1 \\ \hline 2x = -1 \\ x = -\frac{1}{2} \end{array}$$

Sep 21-8:15 PM

Completing the Square

- quadratic equation must be in descending order $ax^2 + bx + c = 0$
- "a" must equal 1
- move the constant "c" to the other side
- take 1/2 of the middle term "b" and square it
- add this to both sides of the equation
- factor the left side...it should be a perfect square ... ()²
- simplify the right side
- take the square root of both sides
- solve

example: solve by completing the square
 $x^2 - 4x + 2 = 0$

$$x^2 - 4x + 4 = -2 + 4$$

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

$$(x-2)(x-2) = 2$$

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

$$\sqrt{(x-2)^2} = \pm\sqrt{2}$$

$$\begin{array}{r} x-2 = \pm\sqrt{2} \\ +2 \quad +2 \\ \hline x = 2 \pm\sqrt{2} \end{array}$$

Sep 21-8:16 PM

Sep 21-8:24 PM

example: solve by completing the square

$$x^2 + 6x + 3 = 0$$

$$\begin{array}{r} -3 \quad -3 \\ \hline x^2 + 6x + 9 = -3 + 9 \end{array}$$

$$\frac{1}{2}(6) = 3^2 = 9$$

$$(x+3)(x+3) = 6$$

$$\sqrt{(x+3)^2} = \sqrt{6}$$

$$x+3 = \pm\sqrt{6}$$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$x = -3 \pm \sqrt{6}$$

Sep 21-8:25 PM

example: solve by completing the square

$$x^2 + 3x - 1 = 0$$

$$x^2 + 3x = 1$$

$$\frac{1}{2}(3) = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

$$x^2 + 3x + \frac{9}{4} = 1 + \frac{9}{4}$$

$$\left(x + \frac{3}{2}\right)\left(x + \frac{3}{2}\right) = \frac{13}{4}$$

$$\left(x + \frac{3}{2}\right)^2 = \frac{13}{4}$$

$$\sqrt{\left(x + \frac{3}{2}\right)^2} = \pm\sqrt{\frac{13}{4}}$$

$$x + \frac{3}{2} = \pm\frac{\sqrt{13}}{2}$$

$$x = \frac{-3 \pm \sqrt{13}}{2}$$

Sep 21-8:26 PM

HW

pg 50

#7,9,11,13,15,17, 29

WS

1,5,9,13,17,

21,25,27

Sep 21-8:27 PM