

Alg. I BE MONDAY 3-15-10

Welcome BACK ☺. TODAY STARTS QUARTER 4!

- ① Find the equation of the line through  $(-2, 7)$ ,  $(2, 3)$ . Graph the line
  - ② Find the equation of the line through  $(-1, -4)$ ,  $(3, 0)$ . Graph the line on the same graph as #①
  - ③ Solve: 
$$\begin{cases} y = -x + 5 \\ y = x - 3 \end{cases}$$
  - ④ Simplify  $\sqrt{24}$
  - ⑤ Simplify  $\frac{2}{\sqrt{6}}$
- 

How would you solve  $x^2 = 19$ ?

How about  $\sqrt{x} = 19$ ?

①\*

RADICAL EQUATIONS WITH VARIABLES  
UNDER THE RADICAL SIGN.

$$\text{EX) } \sqrt{x+4} = 6$$


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Q HOW TO SOLVE RADICAL EQUATIONS?

A GET THE "RADICAL TERM" by itself,  
then square both sides. Solve. Always  
check.

$$\text{EX) } \sqrt{x+4} = 6$$

$$(\sqrt{x+4})^2 = 6^2$$

$$x+4 = 36 \quad \therefore \boxed{x=32}$$

$$\underline{\text{CK}} \quad \sqrt{(\quad)+4} \stackrel{?}{=} 6$$

$$\sqrt{(32)+4} \stackrel{?}{=} 6 \quad \checkmark$$

Q Why Always check?

A Recall that the number of solutions to an equation equals the degree of the equation...

ex) Linear  $\Rightarrow x^1 \Rightarrow$  ONE SOLUTION

ex) Quadratic  $\Rightarrow x^2 \Rightarrow$  TWO SOLUTIONS  

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

ex) Cubic  $\Rightarrow x^3 \Rightarrow$  three solutions

$\vdots$   
 $\downarrow$   
 etc.

But squaring both sides of a radical equation changes its degree and may create a false solution.

$\nearrow$   
 called an EXTRANEIOUS solution.

①\*  $\nearrow$

$\nwarrow$  extra, unnecessary

## CH. 11-3 RADICAL EQUATIONS

EX 3  
Pg 599

$$\sqrt{x+2} = x-4$$

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

$$\begin{array}{rcl} x+2 & = & x^2 - 8x + 16 \\ -x-2 & & -x \quad -2 \end{array}$$

PERFECT SQUARE TRINOMIAL PATTERN

$$0 = x^2 - 9x + 14$$

$$a=1$$

$$b=-9$$

$$c=14$$

$$b^2 - 4ac$$

$$(-9)^2 - 4(1)(14)$$

$$81 - 56 = \boxed{25 = D}$$

$$x = \frac{-b \pm \sqrt{D}}{2a} = \frac{9 \pm 5}{2}$$

$$x = \{7, 2\}$$

PERFECT SQUARE, COULD FACTOR USING MAGIC NUMBERS

CK  
 $x=7$

$$\sqrt{(\quad)+2} \stackrel{?}{=} x-4$$

$$\sqrt{9} \stackrel{?}{=} (7)-4$$

$$3 \stackrel{?}{=} 3 \checkmark$$

CK  
 $x=2$

$$\sqrt{(2)+2} \stackrel{?}{=} (2)-4$$

$$\sqrt{4} \stackrel{?}{=} -2$$

$$2 \neq -2 \text{ NO}$$

$$\therefore \boxed{x = \{7\}}$$

NOTE:  $-\sqrt{4} = -2$

$$\text{Ex) } \sqrt{8x} + 1 = 5$$

$$\sqrt{8x} = 4$$

$$8x = 16 \quad \therefore x = 2$$

$$\underset{x=2}{\text{CK}} \quad \sqrt{8(2)} + 1 \stackrel{?}{=} 5$$

$$4 + 1 = 5 \quad \checkmark \quad \therefore \boxed{x = \{2\}}$$

$$\text{Ex) } \sqrt{2x} = -8$$

$$2x = 64$$

$$x = 32$$

$$\underset{x=32}{\text{CK}} \quad \sqrt{2(32)} \stackrel{?}{=} -8$$

$$\sqrt{64} = -8$$

$$8 \neq -8$$

$$\therefore \boxed{\text{NO SOLUTION}}$$

$$\textcircled{\text{Ex}} \quad 4 + \sqrt{x-2} = x$$

$$\sqrt{x-2} = x - 4$$

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

$$\begin{array}{rcl} x-2 & = & x^2 - 8x + 16 \\ -x+2 & & -x+2 \end{array}$$

$$x^2 - 9x + 18 = 0$$

$$\text{Sum} \Rightarrow -9$$

$$\text{Prod} \Rightarrow 18$$

$$\begin{array}{r} -3 \quad -6 \end{array}$$

$$\therefore (x-3)(x-6) = 0 \quad \therefore x = 3, 6$$

$$\begin{array}{l} \underline{\text{CK}} \\ x=3 \end{array} \quad \begin{array}{l} 4 + \sqrt{3-2} \stackrel{?}{=} ( ) \\ 4 + \sqrt{1} \stackrel{?}{=} 3 \\ 5 \neq 3 \end{array} \quad \left. \begin{array}{l} \underline{\text{CK}} \\ x=6 \end{array} \right\} \begin{array}{l} 4 + \sqrt{6-2} \stackrel{?}{=} ( ) \\ 4 + \sqrt{4} \stackrel{?}{=} 6 \\ 4 + 2 \stackrel{?}{=} 6 \checkmark \end{array}$$

$x=3$  is an extraneous solution

$$\therefore \boxed{x = \{6\}}$$

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- Homework: ① Read Ch. 11-3 ② Pg 601 17-19, 26-28, 33, 35-37.