

Alg. I BE MONDAY 3-23-09

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 $\frac{2}{\sqrt{6}}$
-

①*

RADICAL EQUATIONS WITH VARIABLES
EQUATIONS UNDER THE RADICAL SIGN.

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

Q HOW TO SOLVE RADICAL EQUATIONS?

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

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

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

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

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

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

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

$$X = \frac{-b \pm \sqrt{d}}{2a}$$

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

$\vdots$
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

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

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

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

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
 $x=2$

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

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

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

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

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

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

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

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

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

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

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

$$2x = 64$$

$$x = 32$$

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

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

$$8 \neq -8$$

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

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

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

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

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

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

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

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

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

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

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

$x=3$ is an extraneous solution

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

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