Trig 4.7

Solve radical equations*
Solve radical inequalities   **Algebra 2 Ch.5

radical $\sqrt{}$

radical equation $\sqrt{} = $ ~~~~~
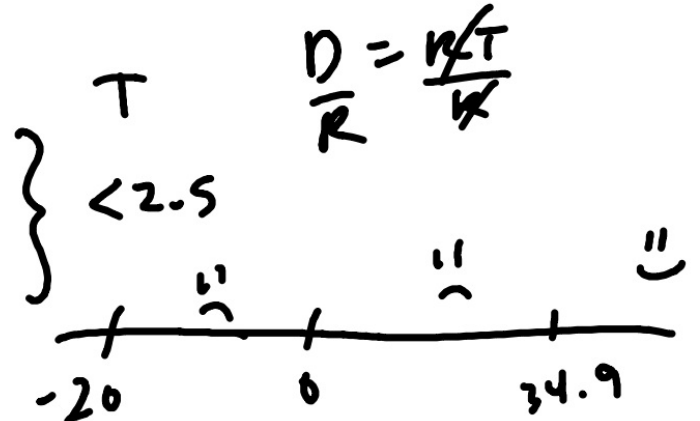
extraneous solutions (might have to DQ...)

radical inequality (solutions must be REAL)

Quiz 4.5-4.6 Thurs.

WB 4.6

13) $D = R \cdot T$

			T
car	30	x	
train	90	(x+20)	} < 2.5

$\frac{D}{R} = \frac{R \cdot T}{R}$

$T_{car} + T_{Tr} < 2.5$

$\frac{x(x+20) \; 30}{x} + \frac{90 \; x(x+20)}{x+20} \le 2.5x(x+20)$

$30(x+20) + 90x = 2.5(x^2 + 20x)$

$30x + 600 + 90x = 2.5x^2 + 50x$

$-30x - 600 - 90x \qquad -30x$
$\qquad\qquad\qquad\qquad -90x$

$\overline{\qquad\qquad 0 = 2.5x^2 \qquad -70x - 600}$

$0 = x^2 - 28x - 240$

$X = \frac{28 \pm \sqrt{(-28)^2 - 4 \cdot 1 \cdot -240}}{2}$

$\frac{-240}{-28}$ (crossed out X)

$= \frac{28 \pm 41.8}{2}$

$= 34.9$

$= 34.9$ (crossed out)

-20   0   34.9

X > 34.9

Algebra 2:

$$\sqrt{x}^2 = 7^2$$

$$x = 49$$

$$\sqrt{x} + 7 = 22$$
$$\underline{-7 \quad -7}$$
$$\sqrt{x}^2 = 15^2 \qquad x = 225$$

$$\sqrt{(x+7)}^2 = 15^2$$

$$x + 7 = 225$$
$$\underline{-7 \qquad -7}$$
$$x = 218$$

Always check for extraneous answers!

(Because your solutions must be REAL!)

$$\sqrt{1 - \cancel{4} \cdot \frac{-3}{\cancel{4}}} = 2$$
$$\sqrt{1 + 3} = 2$$

$$\left(\sqrt[3]{-733+4}\right) + 12 = 3$$
$$-9 + 12 = 3$$

$$5 + \sqrt{9} = 2$$
$$5 + 3 = 2 \quad NS$$

Solve each equation.

4. $\sqrt{1 - 4t} = 2$

$$1 - 4t = 4$$
$$\begin{array}{cc} -1 & -1 \\ \hline \end{array}$$
$$\frac{-4t}{-4} = \frac{3}{-4}$$

$$t = \frac{3}{4}$$

5. $\sqrt[3]{x + 4} + 12 = 3$

$$\begin{array}{cc} 3 & -12 -12 \end{array}$$
$$\sqrt[3]{x+4} = -9$$
$$x + 4 = -729$$
$$\quad -4 \quad -4$$
$$x = -733$$

6. $5 + \sqrt{x - 4} = 2$

$$\begin{array}{cc} -5 & -5 \end{array}$$
$$\sqrt{x-4}^{2} = (-3)^{2}$$
$$x - 4 = 9$$
$$\quad +4 \quad +4$$
$$x = 13$$

2 Solve $x = \sqrt{x+7} + 5$.

$$(x-5)^2 = \sqrt{x+7}^2$$

$$x^2 - 10x + 25 = x+7$$
$$\underline{-x \quad -7 \qquad -x-7}$$

$$x^2 - 11x + 18 = 0$$

$$(x-9)(x-2) = 0$$
$$x=9 \qquad x=2$$

$$9 = \sqrt{9+7} + 5$$
$$9 = \sqrt{16} + 5$$
$$9 = 4 + 5$$

$$2 = \sqrt{2+7} + 5$$
$$2 = \sqrt{9} + 5$$
$$2 = 3 + 5$$

$$\boxed{X = 9}$$

13-270   p255

3 Solve $4 = \sqrt[3]{x + 2} + 8$.

EWE   eeewe!
Rule of thumb: number of √ = number of rounds...

4 Solve $\sqrt{x + 10} = 5 - \sqrt{3 - x}$.

Inequalities: Solutions must be REAL! What would make them not real?

5 Solve $\sqrt{4x + 5} \le 10$.

Solve each inequality.

9. $\sqrt{5x + 4} \leq 8$

10. $3 + \sqrt{4a - 5} \leq 10$

7. $\sqrt{6x - 4} = \sqrt{2x + 10}$

8. $\sqrt{a + 4} + \sqrt{a - 3} = 7$