Chapter 1.4 Notes
Radical Equations

1) Find the real solutions of the equation. $\sqrt{3x-9} = 9$

Square both sides to get rid of $\sqrt{}$ sign

$$\left(\sqrt{3x-9}\right)^2 = (9)^2$$

$$3x - 9 = 81$$

$$+9 \quad +9$$

$$\frac{3x}{3} = \frac{90}{3}$$

$$x = 30$$

* First to get rid of the square root sign, we will square both sides.
* When we do this, we can just remove the square root sign from the one side, and we square the other side.
* Now we want to get X all by itself on one side, so we will move the number on the left side to the right side by doing the opposite. Since it is a subtraction, we will add it to both sides.
* Now, to get rid of the number in front of X, we will divide both sides by the number in front of X.

2.) Find the real solutions of the equation. $\sqrt{21-4x} = x$

$$\left(\sqrt{21-4x}\right)^2 = (x)^2$$ ← Square both sides

$$21-4x = x^2$$

$$-x^2 \qquad -x^2$$

$$-x^2+21-4x = 0$$

$$-x^2-4x+21=0$$

$a=-1$ $b=-4$ $c=21$

$$\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$ } Quadratic formula

$$\frac{-(-4)\pm\sqrt{(-4)^2-4(-1)(21)}}{2(-1)}$$

$$x = \boxed{3}, -7$$ ← a square root can never equal a negative number

* First to get rid of the square root sign, we will square both sides.
* When we do this, we can just remove the square root from the one side and we just square the other side.
* Now, since we have an X , that can not cancel out, we will move everything to the same side of the equal sign, so that everything will equal 0.
* We will move the term on the right to the left by doing the opposite, add or subtract.
* Now we have everything equal to 0.
* Rearrange so that the x^2 term is first, then the s term, then the number by itself.
* Now we will use the quadratic formula.
* a= the number in front of X^2,b= the number in front of X, and c= the number by itself.
* Replace each letter with the number that it equals.
* Then you will type it into your calculator.
* The first time you will use the + sign.
* The second time you will use the - sign.
* These will be your 2 answers.
* However, if you tried to put each of those numbers back into the original equation, you would see that a square root could not equal a negative number, so it could not be -7.