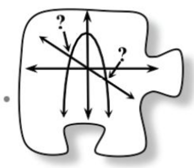
CW#____ Name:________________

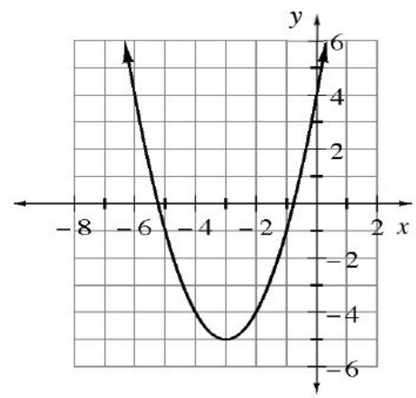


3.1.1 How can I solve the equation?

Strategies for Solving Equations

#1 SOLVING GRAPHICALLY

One of the big ideas of Chapter 2 was how to determine special points on the graph of a function. For example, you used the equation of a parabola written in graphing form to locate its vertex without graphing. But what about the locations of other points on the parabola? Consider the graph of $y = (x + 3)^2 - 5$ at right.



a. How many solutions does the equation $y = (x + 3)^2 - 5$ have? How is this shown on the graph?	b. How many solutions does the equation $(x + 3)^2 - 5 = 4$ have? How is this shown on the graph?	c. Use the graph to solve the equation $(x + 3)^2 - 5 = 4$. How did the graph help you solve the equation?

#2 ALGEBRAIC STRATEGIES

Solve the equation $(x + 3)^2 - 5 = 11$ in two different strategies.

Method 1	**Method 2**

#3 Three strategies your class or team may have used in problem 3-2 are:

- **Rewriting:** Using algebra to write a new equivalent equation that is easier to solve.
- **Looking Inside:** Reasoning about the value of the expression inside the function or parentheses.
- **Undoing:** Reversing or doing the opposite of an operation; for example, taking a square root to eliminate squaring.

Given: $\frac{x-5}{4}+\frac{2}{5}=\frac{9}{10}$

a. Ernie decides to multiply both sides of the equation by 20 so that his equation becomes $5(x-5)+8=18$. Which strategy does Ernie use? How can you tell?	b. Elle takes Ernie's equation and decides to subtract 8 from both sides to get $5(x-5)=10$. Which strategy does Elle use?	c. Eric looks at Elle's equation and says, "*I can tell that (x – 5) must equal 2 because 5 · 2 = 10. Therefore, if x – 5 = 2, then x must be 7*." What strategy does Eric use?

#4 Given: $x^2+2.5x-1.5=0$

a. Rewrite the equation so that it has no decimals.	b. Rewrite your equation again, so that you can solve it without using the Quadratic Formula. Then solve your equation.

#5 Solve each equation, if possible, using any strategy. Name your strategy and check with your teammates to see what strategies they choose. Be sure to check your solutions algebraically.	
a. $4\|8x-2\|=8$ **Strategies used:**	b. $3\sqrt{4x-8}+9=15$ **Strategies used:**
c. $(2y-3)(y-2)=-12y+18$ **Strategies used:**	d. $\frac{5}{x}+\frac{1}{3x}=\frac{4x}{3}$ **Strategies used:**

#6 Graciela and Walter are working on solving each of the equations at below. i. $x^2+7x+12=0$ ii. $(\frac{1}{2}x+7)^2+7(\frac{1}{2}x+7)+12=0$	
a.	b. $\square^2 + 7\square + 12 = 0$
c . $\square = -3$ $\square = -4$	d.

#7 Consider each of the following equations. What structure can you see that might help you rewrite the equation?	
a. $(m^2 + 5m - 24)^2 - (m^2 + 5m - 24) = 6$ **u=** **Rewritten Equation:**	b. $x^{2/3} - x^{1/3} - 56 = 0$ **u=** **Rewritten Equation:**

c. $y^6 + 3y^3 - 18 = 0$ **u=** **Rewritten Equation:**	d. $p - 12\sqrt{p} = -35$ **u=** **Rewritten Equation:**	e. $3^{\sqrt{x+\frac{1}{4}}} = 9^{\left(\sqrt{x+\frac{1}{4}}\right)^2}$ **u=** **Rewritten Equation:**

#8 Solve two of the equations from problem #7 using the *"u"* substitution.	
Equation 1:	Equation 2: