

Warm up

week 4

Use the Quadratic Formula

Use the quadratic formula to solve the equation.

$$4x^2 - 13x + 3 = 0$$

$$a = 4, b = -13, c = 3$$

$$x = \frac{13 \pm \sqrt{(-13)^2 - 4(4)(3)}}{2(4)}$$

$$= \frac{13 \pm \sqrt{169 - 48}}{8} = \frac{13 \pm \sqrt{121}}{8}$$

$$x = \frac{13 + 11}{8}$$

$$x = \frac{13 - 11}{8}$$

$$x = 3$$

AND

$$x = \frac{1}{4}$$

Homework Questions?

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

② LAST UNIT/Experience Exponents		① CURRENT UNIT Quadratic Equations		③ NEXT UNIT/Experience Factoring	
⑧ Student Activities or Assignments		⑤ UNIT MAP is about			
⑦ UNIT SELF-TEST QUESTIONS		<ol style="list-style-type: none"> How can you solve a quadratic equation by using square roots? How do you simplify radical expressions? What steps are necessary to graph a quadratic equation? How is the quadratic formula used to solve a quadratic equation? How is the discriminant found and what information does it tell you? 		⑥ UNIT RELATIONSHIPS Solve Simplify Graph Compare.	

9.6 Applications of the Discriminant

- Goals:**
- Use the discriminant to find the number of solutions of a quadratic equation.
 - Apply the discriminant to solve real-life problems.

EQ: What is the discriminant and what does it tell us?

Vocabulary

Discriminant:

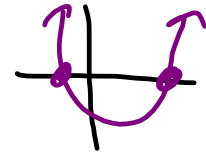
$$b^2 - 4ac$$

in the quadratic formula

THE NUMBER OF SOLUTIONS OF A QUADRATIC EQUATION

Consider the quadratic equation $ax^2 + bx + c = 0$.

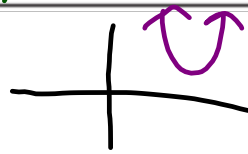
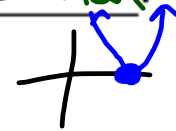
• If $b^2 - 4ac$ is positive, then the equation has
 $\sqrt{25}$ 2 solutions.



• If $b^2 - 4ac$ is zero, then the equation has 1 solution.

• If $b^2 - 4ac$ is negative, then the equation has

$\sqrt{36}$ No Soln.
 (No Real Soln.)

**Example 1: Finding the Number of Solutions**

Find the value of the discriminant and use the value to tell if the equation $x^2 - 2x - 9 = 0$ has *two solutions*, *one solution*, or *no real solution*.

$$a=1, b=-2, c=-9$$

$$b^2 - 4ac$$

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

$$4 + 36$$

$$40$$

pos. #

2 soln

Example 2: Finding the Number of Solutions

Find the value of the discriminant and use the value to tell if the equation has *two solutions*, *one solution*, or *no real solution*.

a) $x^2 - 8x + 16 = 0$

$a=1, b=-8, c=16$

$(-8)^2 - 4(1)(16)$

$64 - 64$

1 soln

b) $-3x^2 + 4x - 5 = 0$

$a=-3, b=4, c=-5$

$4^2 - 4(-3)(-5)$

$16 - 60$

-44

No soln

Try It Tell if the equation has *two solutions*, *one solution*, or *no real solution*.

1) $-x^2 - 5x - 9 = 0$

$a=-1, b=-5, c=-9$

$(-5)^2 - 4(-1)(-9)$
 $25 - 36$

No soln.

$b^2 - 4ac$

2) $4x^2 - 4x + 1 = 0$

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

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

$16 - 16 = 0$

1 solution

3) $8x^2 + 8x + 1 = 0$

$a=8, b=8, c=1$

$8^2 - 4(8)(1)$

$64 - 32 = 32$

2 soln

4) $-2x^2 + 3x - 5 = 0$

$A=-2, B=3, C=-5$

$3^2 - 4(-2)(-5)$

$9 - 40$

-31

No soln

No Real Soln.

Example 3: Finding the Number of x-intercepts

Use the related equation to find the number of x-intercepts of the graph of the function.

a) $y = x^2 - 2x - 1$

$a=1, b=-2, c=-1$

$b^2 - 4ac$

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

$4 + 4 = 8$

2 solns

b) $y = x^2 - 2x + 3$

$a=1, b=-2, c=3$

$(-2)^2 - 4(1)(3)$

$4 - 12$

-8

No Real Soln

Try It

Find the number of x-intercepts of the graph of the function.

5) $y = x^2 - 2x + 1$

$a=1, b=-2, c=1$

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

$4 - 4 = 0$

one soln

7) $y = 3x^2 - 6x + 3$

$a=3, b=-6, c=3$

$(-6)^2 - 4(3)(3)$

$36 - 36$

0

one soln

6) $y = x^2 - 4x + 5$

$a=1, b=-4, c=5$

$b^2 - 4ac$

$(-4)^2 - 4(1)(5)$

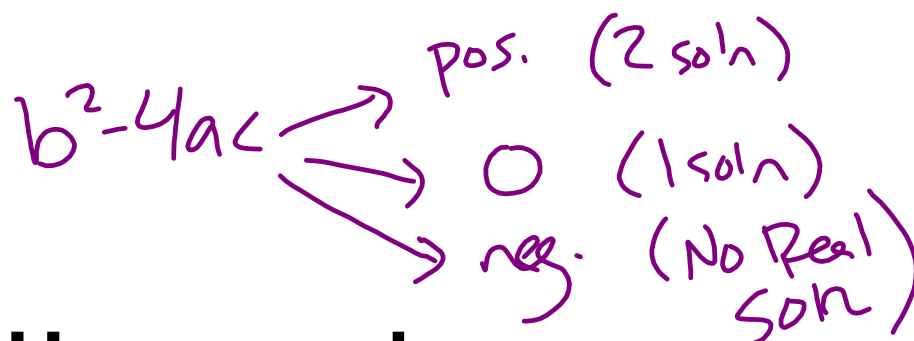
$16 - 20$

-4

No Soln

Summary

EQ: What is the discriminant and what does it tell us?



9.6 Homework

p. 544 #9-20

& Start Ch.9 Crossword

#15-17
(# sol's of
match graph)