DISCRIMINANT: $b^2 - 4ac$ P-54

The discriminant determines the number and type of solutions of any quadratic (remember to set the equation = 0 first).

What is a solution/root/zero? x-intercept

Discriminant	# of roots	types of roots
-Positive	**2**	**real**

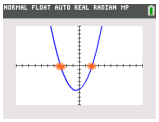
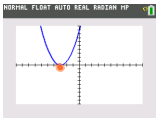
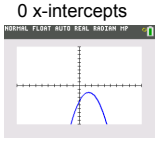
(if the discriminant is a perfect square the roots are rational and the equation can be factored...and if not a perfect square the roots are irrational) $2\sqrt{3}$

-Zero	**1**	**real**

(this is a called a double root...where the graph "bounces" off of the x-axis)

-Negative	**0**	**real**

(no real roots means there must be 2 complex or imaginary)

2 x-intercepts	1 x-intercept	0 x-intercepts
		
How many and what type of solutions: 2 Real	How many and what type of solutions: 1 Real	How many and what type of solutions: 0 Real (2 complex)
What kind of discriminant: positive	What kind of discriminant: Zero	What kind of discriminant: negative

P-55

Name _____ Period _____

5.3A *Number and Type of Solutions: Part I*

1. What is the discriminant? What does it do?

b^2-4ac → tells us the number and type of solutions for the quadratic

Remember: $ax^2+bx+c=0$

#2 – 9: Find the discriminant, the number of solutions and the type of solutions for each equation.

2. $x^2+6x+10=0$

$a=1$, $b=6$, $c=10$

b^2-4ac

$(6)^2-4(1)(10)$

$36-40$

discriminant: -4

number of solutions: 2

type of solutions: complex

negative

3. $3x^2+2x=1$

$-1 \quad -1$

$3x^2+2x-1=0$

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

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

discriminant: 16

number of solutions: 2

type of solutions: Real (Rational b/c 16 is a perf square)

positive

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

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

discriminant: 0

number of solutions: 1

type of solutions: Real

5. $12x^2=11x+2$

$-12x^2 \quad -12x^2$

$0=-12x^2+11x+2$

$a=-12$, $b=11$, $c=2$

discriminant: 217

number of solutions: 2

type of solutions: real (irration

Name _____ Period _____

5.3A *Number and Type of Solutions: Part I*

#2 – 9 (continued): Find the discriminant, the number of solutions and the type of solutions for each equation.

6. $8x+1=-16x^2$

$+16x^2 \quad +16x^2$

$16x^2+8x+1=0$ ✓

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

b^2-4ac

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

discriminant: 0

number of solutions: 1

type of solutions: Real

7. $7x^2+16x+11=0$

discriminant: _____

number of solutions: _____

type of solutions: _____

8. $5x^2-11x+6=0$

discriminant: _____

number of solutions: _____

type of solutions: _____

9. $0=4x^2+5x+2$

discriminant: _____

number of solutions: _____

type of solutions: _____

10. On a quiz, Brittani used the discriminant to find the number and type of solutions. Find her mistake and find the correct solution.

$0=x^2-6x+5$

b^2-4ac

$-6^2-4(1)(5)$

$-36-20$

discriminant: -56

solutions: 2 imaginary solutions

Homework:

P-59 #1, 4-7

P-60