

# HOMEWORK: THE DISCRIMINANT

Name: \_\_\_\_\_

Date: Jan. 16 Alg. 1 H - glue on page 99

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**Aim:**

- Find the Discriminant ( $b^2 - 4ac$ )
- Determine the number of the roots (2 roots, 1 root, or NO roots)
- Use the Quadratic formula to find the EXACT Roots

1.)  $x^2 + 3x - 4 = 0$       $a = \underline{1}$     $b = \underline{3}$     $c = \underline{-4}$

Discriminant:  $b^2 - 4ac$      Quadratic Formula:  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$(3)^2 - 4(1)(-4)$       $x = \frac{-(-3) \pm \sqrt{25}}{2(1)}$

$\uparrow$  25 Perfect sq. discriminant

$x = \frac{-3 \pm 5}{2} = \begin{cases} \frac{-3+5}{2} = 1 \\ \frac{-3-5}{2} = -4 \end{cases}$

Number of Roots: 2

Type (Nature) of the Roots: 2 rational roots

2.)  $2x^2 + 4x + 1 = 0$       $a = \underline{2}$     $b = \underline{4}$     $c = \underline{1}$

Discriminant:  $b^2 - 4ac$      Quadratic Formula:  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$(4)^2 - 4(2)(1)$       $x = \frac{-(-4) \pm \sqrt{8}}{2(2)}$

$\uparrow$  8

$x = \frac{-4 \pm \sqrt{8}}{4} = \frac{-4 \pm 2\sqrt{2}}{2}$

Number of Roots: 2      $x = -2 \pm \sqrt{2}$

Type (Nature) of the Roots: 2 irrational roots

3.)  $5x^2 - 3 = 0$      $a = 5$     $b = 0$     $c = -3$

Discriminant:

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(0) \pm \sqrt{60}}{2(5)}$$

$$x = \pm \frac{2\sqrt{15}}{10} = \pm \frac{\sqrt{15}}{5}$$

Number of Roots: 2

Type (Nature) of the Roots: 2 irrational roots

4.)  $3x^2 + 10x = 0$      $a = 3$     $b = 10$     $c = 0$

Discriminant:

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-10 \pm \sqrt{100}}{2(3)}$$

$$x = \frac{-10 \pm 10}{6} = \frac{-10+10}{6} = 0$$

$$x = \frac{-10-10}{6} = \frac{-20}{6} = \frac{-10}{3}$$

Number of Roots: 2

Type (Nature) of the Roots: 2 rational roots

5.)  $2x^2 + 7x + 50 = 0$      $a = 2$     $b = 7$     $c = 50$

Discriminant:

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-7 \pm \sqrt{-351}}{2(2)}$$

-351  
neg. discriminant  
means

Number of Roots: 0    no real roots

Type (Nature) of the Roots: imaginary roots

6.)  $4x^2 - 5x = 11$      $a = 4$     $b = -5$     $c = -11$

Discriminant:

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{201}}{2(4)}$$

$$x = \frac{5 \pm \sqrt{201}}{8}$$

Number of Roots: 2

Type (Nature) of the Roots: 2 irrational roots