

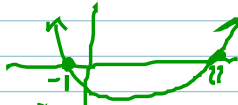
Unit 5.6 - The Quadratic Formula & the Discriminant

pg 293

Ex #1: $x^2 - 10x - 11 = 0$

$$x^2 - 10x - 11 = 0$$

$$x = \frac{10 \pm \sqrt{(-10)^2 - 4(1)(-11)}}{2} = \frac{10 \pm \sqrt{100 - -44}}{2}$$



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

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

$$\frac{10 \pm 12}{2} = \frac{10+12}{2} = 11$$

$$\frac{10-12}{2} = -1$$

Ex #2:

$x^2 + 8x + 16 = 0$

$$-8 \pm \sqrt{64 - 4(1)(16)}$$

$$\frac{-8 \pm \sqrt{0}}{2} = \frac{-8}{2} = -4$$



Ex #3: $2x^2 + 6x - 7 = 0$

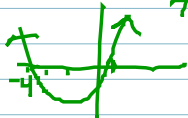
$$-6 \pm \sqrt{36 - 4(2)(-7)}$$

$$\frac{-6 \pm \sqrt{92}}{4} = \frac{-6 \pm 2\sqrt{23}}{4}$$

Ex #4: $x^2 - 6x = -10$

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

$$\frac{6 \pm \sqrt{36 - 4(1)(10)}}{2}$$



$$x = \frac{-3 \pm \sqrt{23}}{2}$$

$x = -3.9$ and 0.9

$$\frac{6 \pm \sqrt{-4}}{2} = \frac{6 \pm \sqrt{-4}}{2}$$

$$\frac{6 \pm 2i}{2} = 3 \pm i$$

pg 296 discriminant $b^2 - 4ac$

$b^2 - 4ac > 0$ + perfect square	1 real rational root	
$b^2 - 4ac > 0$ not a perfect square	2 real irrational roots	

Ex #5a) $7x^2 - 11x + 5 = 0$

$$b^2 - 4ac$$

$$121 - 4(7)(5)$$

$$121 - 140$$

$$-19$$

2 complex roots

5b) $x^2 + 22x + 121 = 0$

$$(22)^2 - 4(1)(121)$$

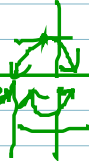
$$484 - 484 = 0$$

1 real rational root

$$b^2 - 4ac = 0$$

1 real irrational root

2 complex roots at $a \pm bi$



Unit 5.6 = The Quadratic Formula & the Discriminant,

pg 293

Ex #1: $x^2 - 10x = 11$
 $-11 \quad -11$

$x^2 - 10x - 11 = 0$

$x = \frac{10 \pm \sqrt{(-10)^2 - 4(1)(-11)}}{2} = \frac{10 \pm \sqrt{100 - -44}}{2}$



$ax^2 + bx + c = 0$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\frac{10 \pm 12}{2} = \frac{10+12}{2} = 11$
 $\frac{10-12}{2} = -1$

Ex #2:

$x^2 + 8x + 16 = 0$
 $-8 \pm \sqrt{64 - 4(1)(16)}$

$\frac{-8 \pm \sqrt{0}}{2} = \frac{-8}{2} = -4$

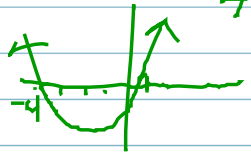


Ex #3: $2x^2 + 6x - 7 = 0$
 $-6 \pm \sqrt{36 - 4(2)(-7)}$

$\frac{-6 \pm \sqrt{36 + 56}}{4} = \frac{-6 \pm \sqrt{92}}{4}$
 $\frac{-6 \pm 2\sqrt{23}}{4} = \frac{-3 \pm \sqrt{23}}{2}$

Ex #4: $x^2 - 6x = -10$
 $+10 \quad +10$

$x^2 - 6x + 10 = 0$
 $\frac{6 \pm \sqrt{36 - 4(1)(10)}}{2}$



$x = \frac{-3 \pm \sqrt{23}}{2}$

$x = -3.9$ and 9

$\frac{6 \pm \sqrt{-4}}{2} = \frac{6 \pm \sqrt{16i^2}}{2}$

$\frac{6 \pm 2i}{2} = 3 \pm i$

pg 296 discriminant $b^2 - 4ac$

$b^2 - 4ac > 0$ + perfect square	1 real rational roots	↑ ↓
$b^2 - 4ac > 0$ Not a perfect square	2 real irrational	

Ex #5a) $7x^2 - 11x + 5 = 0$

$b^2 - 4ac$
 $121 - 4(7)(5)$
 $121 - 140$
 -19

2 complex roots

5b) $x^2 + 22x + 121 = 0$
 $(22)^2 - 4(1)(121)$
 $484 - 484 = 0$

∴ 1 real rational Root

$b^2 - 4ac = 0$

$b^2 - 4ac = 0$	1 real rational root	↑ ↓
$b^2 - 4ac < 0$	2 complex root a+bi	