

DO NOW

Solve: $x^2 - 7x = -10$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$$x-5=0 \text{ or } x-2=0$$

$$x=5$$

$$x=2$$

$\{2, 5\}$

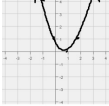
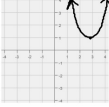
8.8 The Quadratic Formula - Day 2

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

Discriminant: radicand in the quadratic formula

$$\hookrightarrow b^2 - 4ac$$

* Tells the nature of the roots

Value of the Discriminant	Nature of Roots	Number of x-intercepts
1. positive AND perfect square	2 rational roots	2 
2. positive BUT not perfect square	2 irrational roots	2 
3. zero	double root	1 
4. negative	no real roots	0 

Describe the nature of the roots for the equations.

1. $x^2 - 6x + 9 = 0$

$$\begin{aligned} b^2 - 4ac \\ (-6)^2 - 4(1)(9) \\ 36 - 4(9) \\ 36 - 36 \\ 0 \end{aligned}$$

double root

2. $x^2 - 3x - 10 = 0$

$$\begin{aligned} b^2 - 4ac \\ (-3)^2 - 4(1)(-10) \\ 9 - 4(-10) \\ 9 + 40 \\ 49 \end{aligned}$$

2 rational roots

3. $x^2 - 3x + 10 = 0$

$$\begin{aligned} b^2 - 4ac \\ (-3)^2 - 4(1)(10) \\ 9 - 4(10) \\ 9 - 40 \\ -31 \end{aligned}$$

No real roots

4. $4x^2 - 1 = 0$

$$\begin{aligned} b^2 - 4ac \\ 0^2 - 4(4)(-1) \\ 0 - 16(-1) \\ 16 \end{aligned}$$

2 rational roots

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

$$\begin{aligned} b^2 - 4ac \\ (-5)^2 - 4(1)(5) \\ 25 - 4(5) \\ 25 - 20 \\ 5 \end{aligned}$$

2 irrational roots

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

$$\begin{aligned} b^2 - 4ac \\ 6^2 - 4(1)(10) \\ 36 - 4(10) \\ 36 - 40 \\ -4 \end{aligned}$$

No real roots

Solve using the quadratic formula.

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

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

$$a=2$$

$$b=2$$

$$c=-11$$

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

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

$$x = \frac{-2 \pm \sqrt{4 - 8(-11)}}{4}$$

$$x = \frac{-2 \pm \sqrt{4 + 88}}{4}$$

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

$$x = \frac{-2 \pm \sqrt{4 \cdot 23}}{4}$$

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

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

$$x = -\frac{1}{2} \pm \frac{\sqrt{23}}{2}$$

$$x = \frac{-1 \pm \sqrt{23}}{2}$$

HOMEWORK

Worksheet - HW 8.8 - Day 2