Instructional Material 2.4

Discriminant $\Longrightarrow b^2 - 4ac$

3 possible cases that will determine the number and type of roots of a quadratic equation...

$b^2 - 4ac > 0$ (positive)

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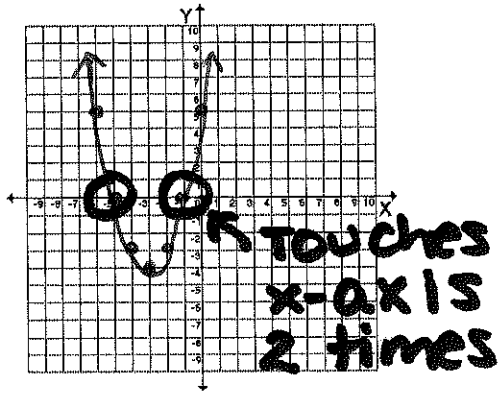
TWO REAL ROOTS



Ex. $x^2 + 6x + 5 = 0$

$a=1 \quad b=6 \quad c=5$

b^2-4ac

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

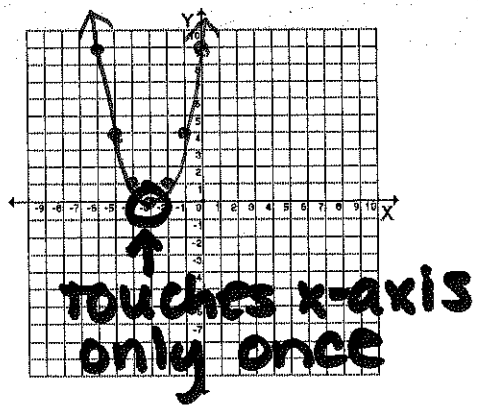
$36-20$

$16 > 0$ so it will have 2 real roots.

$b^2 - 4ac = 0$ (zero)

⇩

ONE REAL ROOT



Ex. $x^2 + 6x + 9 = 0$

$a=1 \quad b=6 \quad c=9$

b^2-4ac

$(6)^2-4(1)(9)$

$36-36$

$0 = 0$ so you will have 1 real root.

$b^2 - 4ac < 0$ (negative)

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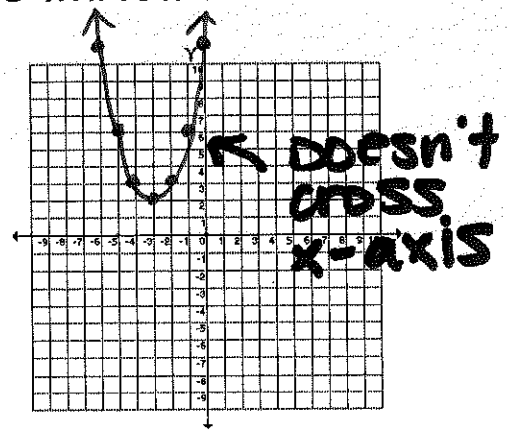
TWO IMAGINARY ROOTS



Ex. $x^2 + 6x + 11 = 0$

$a=1 \quad b=6 \quad c=11$

b^2-4ac

$(6)^2-4(1)(11)$

$36-44$

$-8 < 0$ so you will have 0 real roots but 2 imaginary roots.