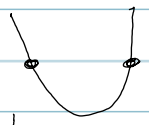
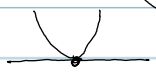
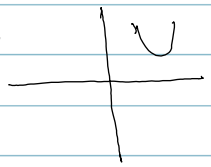
Quadratic Formula

2. Brazilian Method (Everywhere but U.S. method)

$D = b^2 - 4ac$
(D = discriminant)

$D > 0$ (+)  two solutions

$D = 0$ 

$D < 0$ (-) 

Steps

Formula $x = \frac{-b \pm \sqrt{D}}{2a}$

1. Find D
2. $\sqrt{D}$
3. put it all together & simplify

$0 = -2x^2 + 4x - 7$

$a = -2 \quad b = 4 \quad c = -7$

① $D = b^2 - 4ac$
$= (4)^2 - 4(2)(-7)$
$= 16 - 56$
$= -40$

② $\sqrt{D} = \sqrt{-40}$

2 | 40
2 to | 20
2 | 10
5

$\sqrt{2 \cdot 2 \cdot 2 \cdot 5}$

$\sqrt{D} = \sqrt{-40} = 2i\sqrt{10}$

③ $x = \frac{-b \pm \sqrt{D}}{2a}$

$x = \frac{-4 \pm 2i\sqrt{10}}{-4}$

$x = \frac{2 \pm i\sqrt{10}}{2}$

Quadratic Formula

3. (h, k) version of the quadratic form.

$x = h \pm \sqrt{\frac{-k}{a}}$

$0 = -2x^2 + 4x - 7$

$h = \frac{-b}{2a} = \frac{-4}{2(-2)} = 1$

$k = -2(1)^2 + 4(1) - 7$

$= -2 + 4 - 7$

$= -5$

(h, k) $\quad x = h \pm \sqrt{\frac{-k}{a}}$

$(1, -5)$

$x = 1 \pm \sqrt{\frac{-(-5)}{-2}} \quad 1 \pm \frac{\sqrt{10}}{2}$

$x = 1 \pm \sqrt{-2.5} \quad \sqrt{\frac{5}{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{10}}{2}$

$1 \pm i\sqrt{2.5}$