3d) $x^2 - 4kx - 3k = 0$ 2 equal roots

$a = 1$
$b = -4k$
$c = -3k$

$b^2 - 4ac = 0$

$(-4k)^2 - 4(1)(-3k) = 0$

$16k^2 + 12k = 0$

$4k(4k + 3) = 0$ $(4k+0)(4k+3)=0$

$\frac{4k}{4} = \frac{0}{4}$ or $4k + 3 = 0$

$k = 0$

$4k = -3$

$k = -3/4$

$qx^2 - 4qx + 5 - q = 0$

no real roots

$b^2 - 4ac < 0$

$a = q$

$b = -4q$

$c = 5 - q$

$(-4q)(5-q)$

$$(-4q)^2 - 4(q)(5-q) = 0$$

$$16q^2 - 20q + 4q^2 = 0$$

$$20q^2 - 20q = 0$$

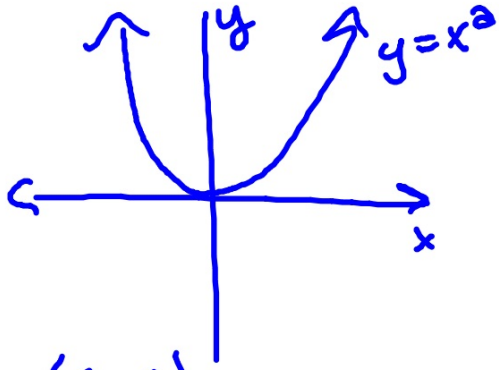
$$20q(q-1) = 0$$

$20q = 0$ or $q - 1 = 0$

$q = 0$ $\quad$ $q = 1$

2.4 Graphs of Quadratic Equations

$ax^2+bx+c=0$



minimum is at $(0,0)$
and it is symmetric about the y-axis

For quadratic functions in standard form, the graph crosses the y-axis at $(0,c)$ and the equation of symmetry is $x=\frac{-b}{2a}$

When the basic quadratic $y = x^2$ undergoes transformations, the resulting functions can be written as

$$y = a(x-h)^2 + K$$

- a: vert. Stretch
- h: horiz. Shift
- K: vert. shift

vertex form; vertex at (h, K)

Ex] $y = x^2 - 6x + 4$. Re-write in vertex form. Sketch and label the vertex and y-intercept.

CTS!

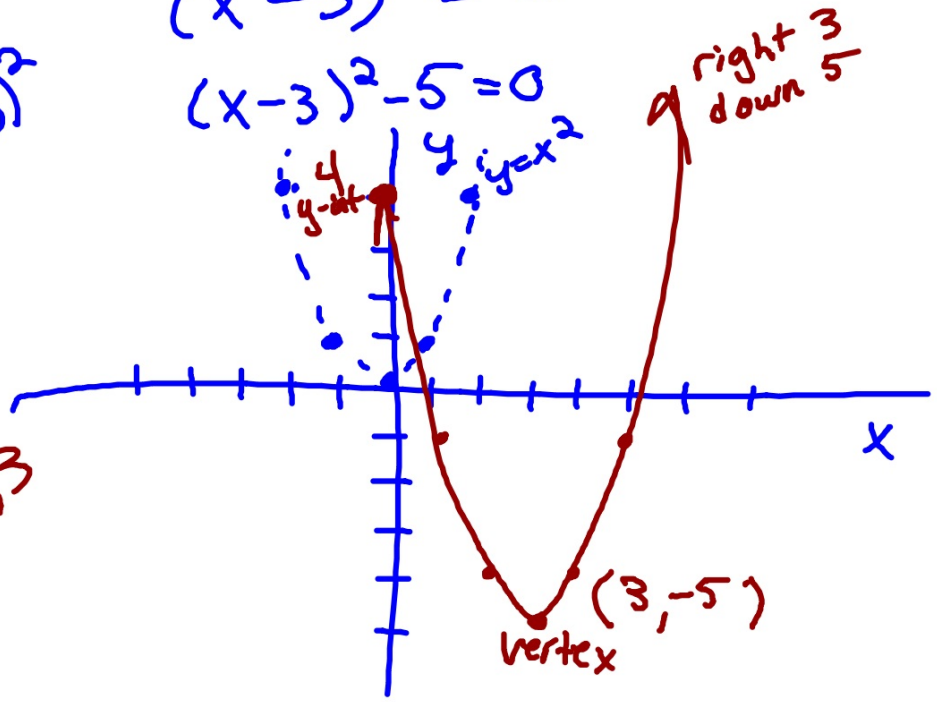
$x^2 - 6x + 9 = -4 + 9$

$(x-3)^2 = 5$

$\frac{b}{2} = (-3)$

$\frac{b}{2} = (-3)^2$

$(x-3)^2 - 5 = 0$



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