Graphing Parabolas (1.1)

Standard form: $ax^2+bx+c=y$

$y = -x^2 + 6x - 8$

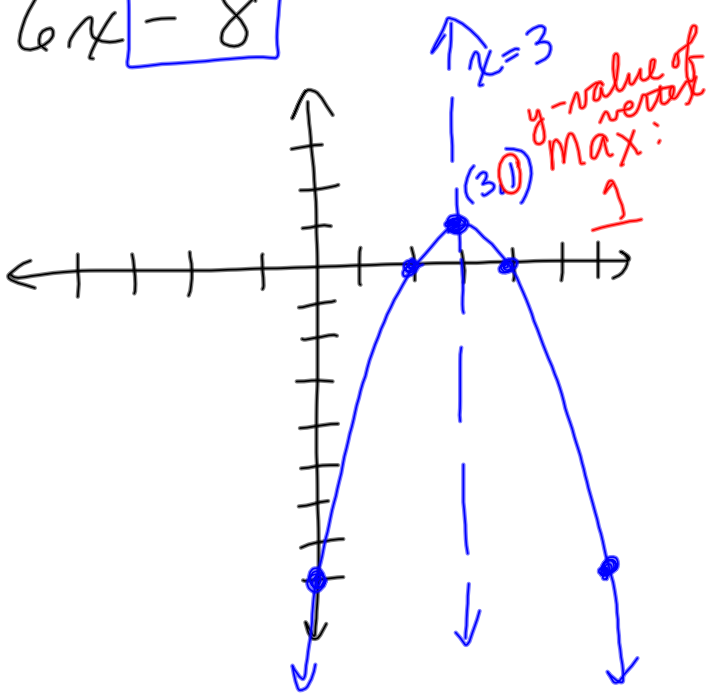
① y-int : -8
$(x=0)$

② $\frac{-b}{2a} = \frac{-6}{2(-1)} = \frac{-6}{-2} = 3$

axis of symmetry
$x = 3$

vertex
$(3, 1)$

$y = -(3)^2 + 6(3) - 8$
$-9 + 18 - 8$
$9 - 8$
1



D: $(-\infty, \infty)$
R: $(-\infty, 1]$

$y = -2x^2 + 4x + 3$ Graph

① y-int : 3

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

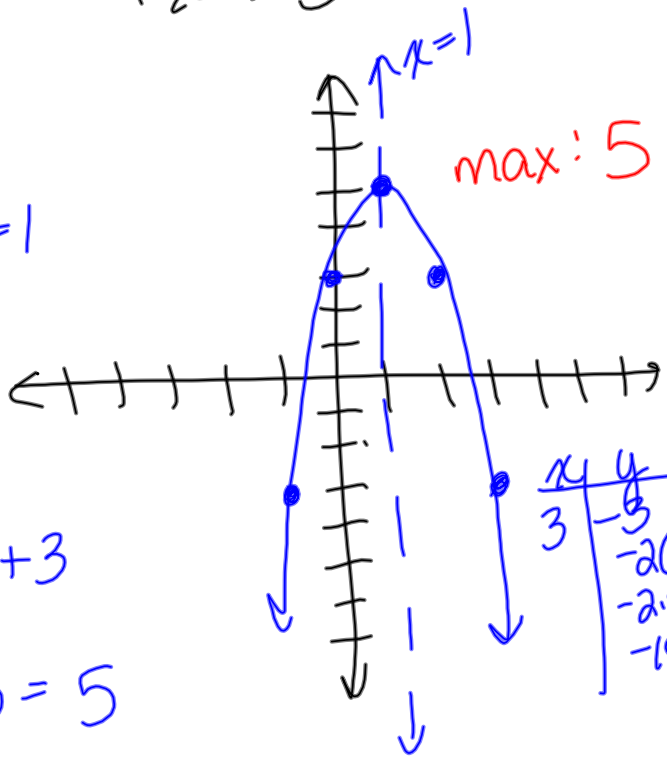
AOS : $x = 1$

vertex : (1, 5)

$y = -2(1)^2 + 4(1) + 3$

$-2 \cdot 1$

$-2 + 4 + 3 = 5$



x	y
3	-3

$-2(3)^2 + 4(3) + 3$

$-2 \cdot 9$

$-18 + 12 + 3$

$-6 + 3$

-3

Find the max or min of
(y → vertex)

a. $y = 4x^2 + 16x - 3$

min
-19

vertex $(-2, -19)$

$\frac{-b}{2a} = \frac{-16}{2 \cdot 4} = \frac{-16}{8} = -2$

$y = 4(-2)^2 + 16(-2) - 3$

$4(4) - 32 - 3$

$16 - 32 - 3$

$-16 - 3$

-19

b. $y = -3x^2 + 18x - 5$

max : 22

vertex : $(3, 22)$

$\frac{-b}{2a} = \frac{-18}{2(-3)} = \frac{-18}{-6} = 3$

$x = 3$

$y = -3(3)^2 + 18(3) - 5$

$-3 \cdot 9 + 54 - 5$

$-27 + 54 - 5$

$27 - 5$

22