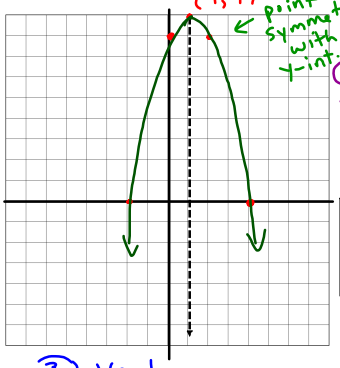
Equation: $y = -x^2 + 2x + 8$



① $a = -1$ $b = 2$ $c = 8$ ← y-int

② $\Delta = b^2 - 4ac$
$= 2^2 - 4(-1)(8)$
$= 4 + 32$
$\Delta = 36$
2 zeros!!

x	y
Don't need table since we have 5 points	

③ Vertex $= \left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right) = \frac{-2}{2(-1)}, \frac{-36}{4(-1)}$

$= \left(\frac{-2}{-2}, \frac{-36}{-4}\right)$

Vertex $= (1, 9)$

④ y-intercept $= (0, c)$

y-intercept $= (0, 8)$

⑤ We know it's ☹ since a is negative

⑥ Draw x- and y- axis

⑦ Plot vertex, y-intercept; draw axis of symmetry.

⑧ Find zeros (by factoring or quadratic formula)

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ ($\Delta = 36$ already found)

We will use

$= \frac{-2 \pm \sqrt{36}}{2(-1)}$

$= \frac{-2 \pm 6}{-2}$

$\oplus \rightarrow \frac{-2+6}{-2} = \frac{4}{-2} = -2 = x_1$

$\ominus \rightarrow \frac{-2-6}{-2} = \frac{-8}{-2} = 4 = x_2$

vertex: (1,9)

y-intercept: (0,8)

point symmetric with y-intercept: (2,8)

coordinates of zeros: (-2,0) and (4,0)

equation of axis of symmetry: $x = h$; $x = 1$

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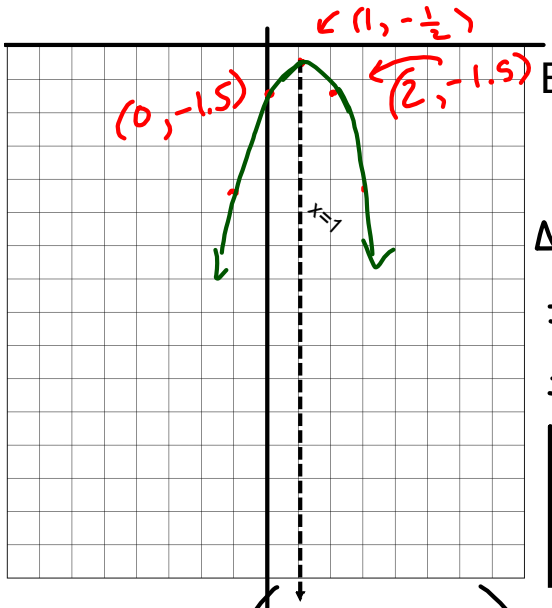


Equation: $y = -x^2 + 2x - \frac{3}{2}$

$a = -1 \quad b = 2 \quad c = -1.5$

$\Delta = b^2 - 4ac$

$= 2^2 - 4(-1)(-1.5)$

$= 4 - 6$

$\Delta = -2$
No Zeros

x	y
-1	-4.5
3	-4.5

Vertex: $\left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right)$

$= \left(\frac{-2}{2(-1)}, \frac{2}{4(-1)}\right)$

$= \left(\frac{-2}{-2}, \frac{2}{-4}\right)$

Vertex = $\left(1, -\frac{1}{2}\right)$

$\downarrow \frac{3}{2}$

* Need another set of points:

Let $x = -1$

$y = -x^2 + 2x - 1.5$

$y = -1(-1)^2 + 2(-1) - 1.5$

$= -1(1) - 2 - 1.5$

$= -1 - 2 - 1.5$

$y = -4.5$

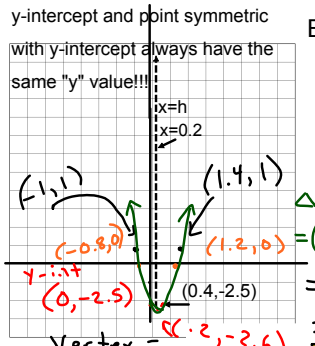
vertex: $\left(1, -\frac{1}{2}\right)$

y-intercept: $(0, -1.5)$

point symmetric with y-intercept: $(2, -1.5)$

coordinates of zeros: none

equation of axis of symmetry: $x = 1$



Equation: $y = \frac{5}{2}x^2 - x - \frac{5}{2}$

$a = 2.5$

$b = -1$

$c = -2.5$

x	y
3 (can't get on)	17
-1	

$\Delta = b^2 - 4ac$

$= (-1)^2 - 4(2.5)(-2.5)$

$= 1 + 25$

$= 26$

$\Delta = 26$
2 zeros

Vertex $= \left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right)$

$\left(\frac{1}{2(2.5)}, \frac{-26}{4(2.5)}\right)$

$= \left(\frac{1}{5}, \frac{-26}{10}\right)$

$a = +$ ∴ ☺

Vertex $= (0.2, -2.6)$

y-int $= (0, c) = (0, -2.5)$

Find zeros:

$\Delta = 26$

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

$= \frac{1 \pm \sqrt{26}}{2(2.5)}$

$= \frac{1 \pm 5.1}{5}$

⊕ → $\frac{1+5.1}{5} = \frac{6.1}{5} = 1.22$ (x_1)

Let $x = 3$

$y = 2.5x^2 - x - 2.5$

$y = 2.5(3)^2 - (3) - 2.5$

$= 2.5(9) - 3 - 2.5$

$= 22.5 - 3 - 2.5$

$= 17$

⊖ → $\frac{1-5.1}{5} = \frac{-4.1}{5} = -0.8$ (x_2)

vertex: (0.2, -2.6)

y-intercept: (0, -2.5)

point symmetric with y-intercept: (0.4, -2.5)

coordinates of zeros: (-0.8, 0) and (1.2, 0)

equation of axis of symmetry: x = 0.2

This question: we didn't really need to fill in the table with more x,y points. We did a couple more

just for the amazing practice!!!

Feb 26-9:06 AM