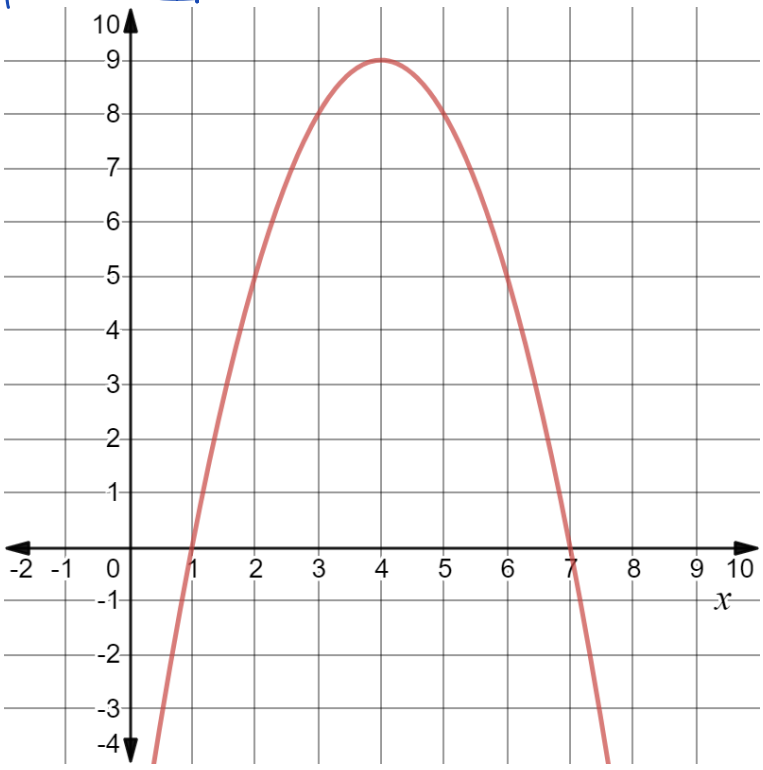
Name: _____ Date: _____

Recall A quadratic function can be written in one of three forms:

1. Standard form $y = ax^2 + bx + c$ ↖ y-intercept.
2. factored form $y = (x-m)(x-n)$ x-intercept(s) $x = m, n$
3. Vertex form $y = a(x-p)^2 + q$ vertex (p, q)

Example On the following graph identify the following features:



$x=1$ $x=7$

$y = -(x-1)(x-7)$

$= -(x^2 - 7x - x + 7)$ F O I L

$= -(x^2 - 8x + 7)$

$= -x^2 + 8x - 7$

1. y-intercept we can't see it ☹ $y=-7$	2. x-intercept(s) $x = 1, 7$	3. Equation of the axis of symmetry $x = 4$
4. Coordinates of the vertex $(4, 9)$	5. Maximum or minimum value $y = 9$	6. Domain and range Domain: $x \in \mathbb{R}$ Range: $y \leq 9$

Example Consider the quadratic function $y = x^2 - 4x + 4$. Find the y-intercept, then factor to find the x-intercept(s). Graph the function either by using these coordinates, or by completing the table of values.

x	0	1	2	3	4	5	6
y							

y-int: $y = 4$

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

$-2 \times -2 = 4$

$-2 + -2 = -4$

$= (x-2)(x-2)$

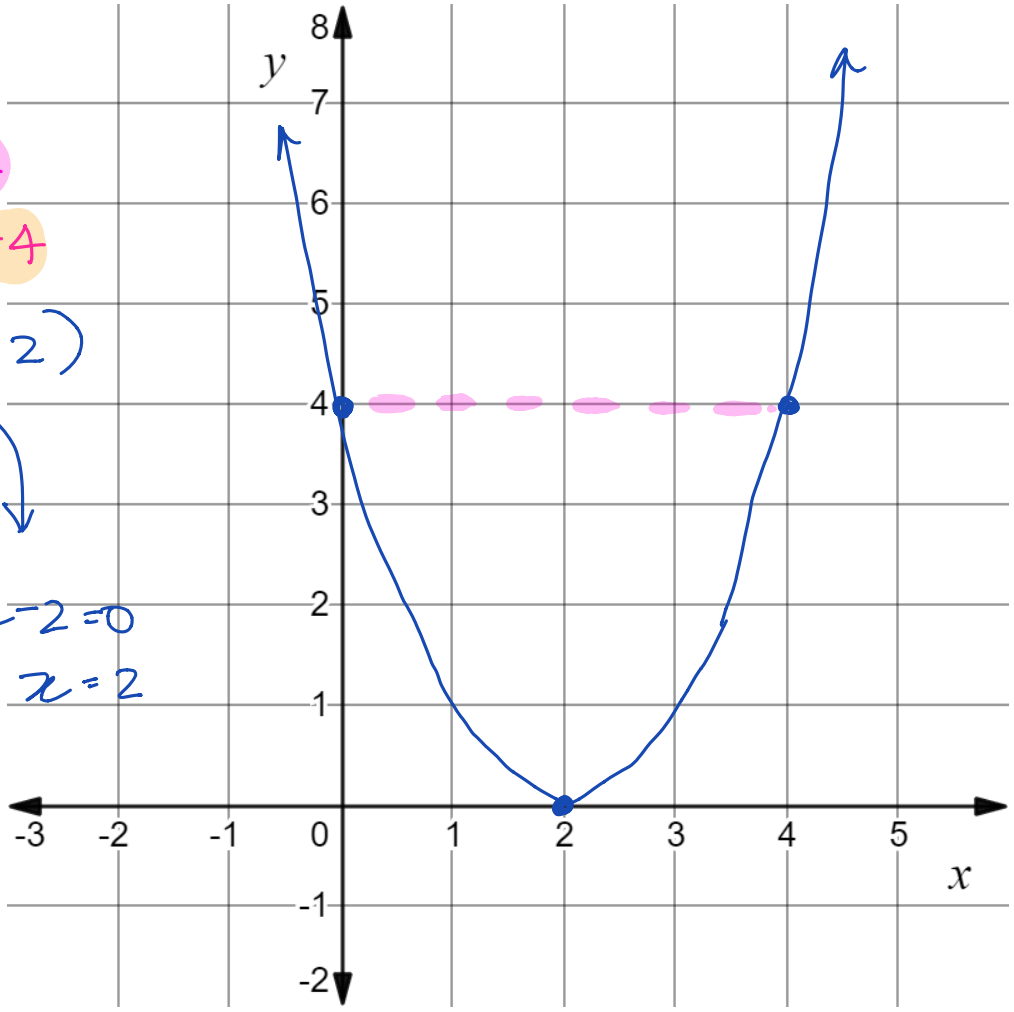
x-int ($y = 0$)

$x - 2 = 0$

$x = 2$

$x - 2 = 0$

$x = 2$



Determine the:

1. y-intercept $y =$ $y = 4$ $(0, 4)$	2. x-intercepts $x =$ $x = 2$ $(2, 0)$	3. Equation of the axis of symmetry $x =$ $x = 2$
4. Coordinates of the vertex (x, y) $(2, 0)$	5. Maximum or minimum value $y =$ $y = 0$	6. Domain and range Domain: $x \in \mathbb{R}$ Range: $y \geq 0$

Ex. #1 Consider the quadratic function $y = -x^2 + 7x - 10$. Find the y-intercept, then factor to find the x-intercept(s). Graph the function either by using these coordinates, or by completing the table of values.

x	0	1	2	3	4	5	6
y							

$y = -(x^2 - 7x + 10)$

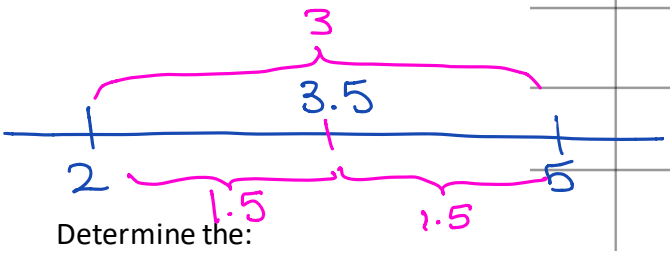
$-5 \times -2 = 10$

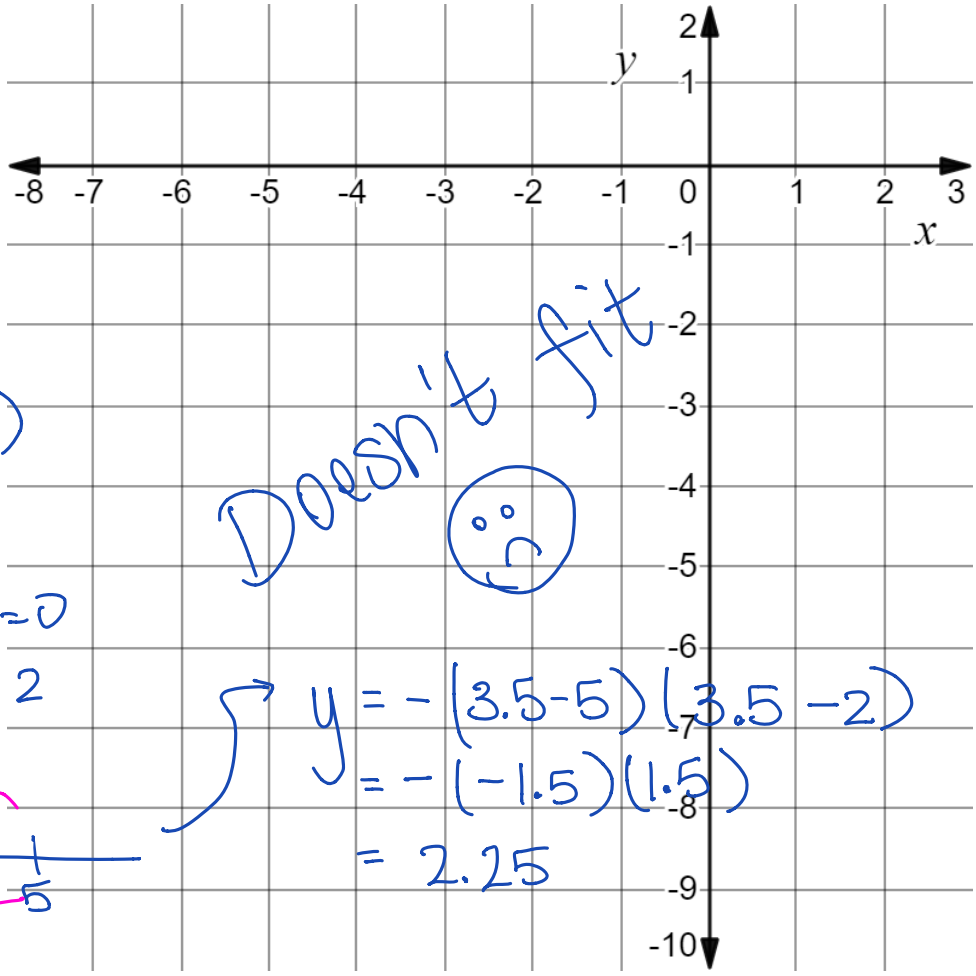
$-5 + -2 = -7$

$y = -(x-5)(x-2)$

$x - 5 = 0$ $\quad x - 2 = 0$

$x = 5$ $\quad x = 2$





Doesn't fit ☹

$y = -(3.5-5)(3.5-2)$

$= -(-1.5)(1.5)$

$= 2.25$

Determine the:

1. y-intercept $y = -10$	2. x-intercepts $x = 5$ $x = 2$	3. Equation of the axis of symmetry $x = 3.5$
4. Coordinates of the vertex $(3.5, 2.25)$	5. Maximum or minimum value $y = 2.25$	6. Domain and range Domain: $x \in \mathbb{R}$ Range: $y \leq 2.25$