Parabola Group Activity with solutions

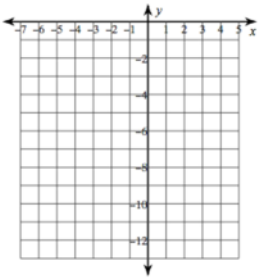
Thursday, February 23, 2023 8:07 PM

Names: A. _____ B. _____ C. _____

This is a GROUP assignment. You have each been assigned a letter – A, B, or C. You should complete the step assigned to you in each problem.

1. $y = 2x^2 - 4x - 6$

PERSON A DOES THIS STEP	PERSON B DOES THIS STEP
Factor the constant of out the first two terms:	Finish the process, to write the equation in vertex form:
What number must be added, to complete the square?	
Circle one: The parabola opens UP / DOWN.	Circle one: The vertex is a MAX / MIN
PERSON C DOES THIS STEP	**PERSON A DOES THIS STEP**
What are the coordinates of the vertex?	Graph the parabola, include 5 points and axis of symmetry:
What is the equation of the axis of symmetry?	
What are the x-intercepts for this graph?	



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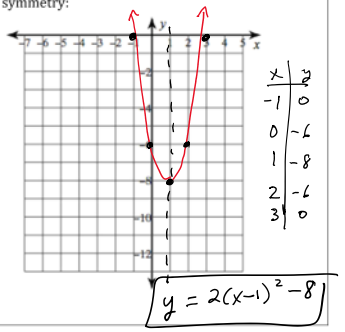
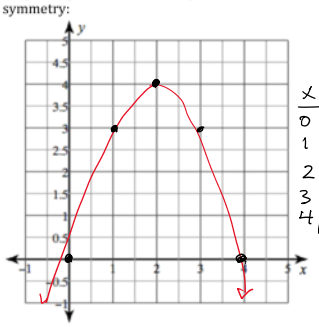
This is a GROUP assignment. You have each been assigned a letter – A, B, or C. You should complete the step assigned to you in each problem.

1. $y = 2x^2 - 4x - 6$

PERSON A DOES THIS STEP	PERSON B DOES THIS STEP
Factor the constant of out the first two terms: $y = 2(x^2 - 2x \quad) - 6$	Finish the process, to write the equation in vertex form: $y = 2(x^2 - 2x + 1 - 1) - 6$ $y = 2(x-1)^2 - 2 - 6$ $y = 2(x-1)^2 - 8$
What number must be added, to complete the square? $\left(\frac{-2}{2}\right)^2 = 1$	
Circle one: The parabola opens (UP) / DOWN.	Circle one: The vertex is a MAX / (MIN)
PERSON C DOES THIS STEP	**PERSON A DOES THIS STEP**
What are the coordinates of the vertex? $(1, -8)$	Graph the parabola, include 5 points and axis of symmetry:
What is the equation of the axis of symmetry? $x = 1$	
What are the x-intercepts for this graph? $0 = 2(x-1)^2 - 8$ $\frac{8}{2} = \frac{2(x-1)^2}{2}$ $4 = (x-1)^2$ $\pm 2 = x - 1$ $1 \pm 2 = x$ $(3, 0)$ and $(-1, 0)$	



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

PERSON B DOES THIS STEP	PERSON C DOES THIS STEP
Factor the constant of out the first two terms: $y = -1(x^2 - 4x \quad)$ What number must be added, to complete the square? $\left(\frac{-4}{2}\right)^2 = 4$ Circle one: The parabola opens UP / (DOWN).	Finish the process, to write the equation in vertex form: $y = -1(x^2 - 4x + 4 - 4)$ $y = -1(x-2)^2 + 4$ Circle one: The vertex is a (MAX) / MIN
PERSON A DOES THIS STEP	**PERSON B DOES THIS STEP**
What are the coordinates of the vertex? $(2, 4)$ What is the equation of the axis of symmetry? $x = 2$ What are the x-intercepts for this graph? $0 = -(x-2)^2 + 4$ $(x-2)^2 = 4$ $x-2 = \pm 2$ $x = 2 \pm 2$ $(4, 0)$ $(0, 0)$	Graph the parabola, include 5 points and axis of symmetry:  $\begin{array}{c\|c} x & y \\ \hline 0 & 0 \\ 1 & 3 \\ 2 & 4 \\ 3 & 3 \\ 4 & 0 \end{array}$

3. $y = 2x^2 + 12x + 20$

PERSON C DOES THIS STEP

Factor the constant of out the first two terms:

$y = 2(x^2 + 6x \quad) + 20$

What number must be added, to complete the square?

$\left(\frac{6}{2}\right)^2 = 9$

Circle one: The parabola opens (UP) / DOWN.

PERSON A DOES THIS STEP

Finish the process, to write the equation in vertex form:

$y = 2(x^2 + 6x + 9 - 9) + 20$

$y = 2(x+3)^2 - 18 + 20$

$y = 2(x+3)^2 + 2$

Circle one: The vertex is a MAX / (MIN)

PERSON B DOES THIS STEP

What are the coordinates of the vertex?

$(-3, 2)$

What is the equation of the axis of symmetry?

$x = -3$

What is the y-intercept for this graph?

$y = 2(0+3)^2 + 2$

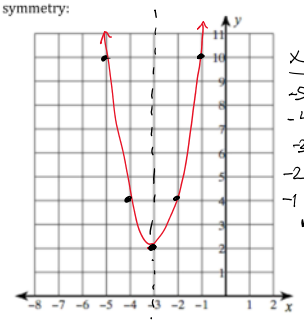
$y = 2(9) + 2$

$y = 20$

$(0, 20)$

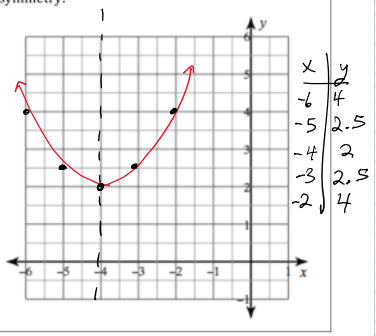
PERSON C DOES THIS STEP

Graph the parabola, include 5 points and axis of symmetry:



x	y
-5	10
-4	4
-3	2
-2	4
-1	10

4. $y = \frac{1}{2}x^2 + 4x + 10$

PERSON A DOES THIS STEP	PERSON B DOES THIS STEP
Factor the constant of out the first two terms: $y = \frac{1}{2}(x^2 + 8x\ \ )+10$ What number must be added, to complete the square? $\left(\frac{8}{2}\right)^2 = 16$ Circle one: The parabola opens UP / DOWN.	Finish the process, to write the equation in vertex form: $y = \frac{1}{2}(x^2+8x+16-16)+10$ $y = \frac{1}{2}(x+4)^2 - 8 + 10$ $y = \frac{1}{2}(x+4)^2 + 2$ Circle one: The vertex is a MAX / MIN
PERSON C DOES THIS STEP	**PERSON A DOES THIS STEP**
What are the coordinates of the vertex? $(-4, 2)$ What is the equation of the axis of symmetry? $x = -4$ What is the y-intercept for this graph? $y = \frac{1}{2}(0+4)^2 + 2$ $= \frac{1}{2}(16) + 2$ $= 10$ $(0, 10)$	Graph the parabola, include 5 points and axis of symmetry:  x | y -6 | 4 -5 | 2.5 -4 | 2 -3 | 2.5 -2 | 4