MPM2D Day 4: Graph Quadratics Using the x-intercepts Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# The vertex in Factored Form

If the zeros of a quadratic relation are r and s, then the x-coordinate ($x\_{v}$) of the vertex is $\frac{r+s}{2}$. We can find the y-coordinate of the vertex by substituting the x-value of the vertex in the equation given.

Ex 1: What is the vertex of $y=2(x-2)(x-6)$?

 Step 1: What are the zeros?

 Step 2: What is the axis of symmetry OR $x\_{v}$?

 Step 3: What is the optimal value ($y\_{v}$)?

Ex 2: What is the vertex of $y=(2x+5)(x-6)$?

Ex 3: Graph $y=-\frac{1}{4}(x+5)(x-7)$ by first finding the vertex?

Ex 4: Find the vertex of $y=\frac{1}{2}(x+2)(x+6)$ then graph the relation.

Ex 5: Describe the transformations of quadratic relation with x-intercepts at -1 and 5, and passing through the point .

Extra Practice: **Standard Form, Factored Form, Vertex Form**

1. Fill in the missing entries.

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|  | **Standard form** | **Factored form** | **x-intercepts** | **Vertex** | **Vertex form** |
| *a* | *y= 2x2 + x - 6* |  |  |  |  |
| *b* | *y = x2 - 7x – 18* |  |  |  |  |
| *c* |  |  |  |  | *y = -3(x - 1)2 + 27* |
| *d* |  | *y=(x + 2)(x-6)* |  |  |  |
| *e* |  | *y=(2x-3)(x + 7)* |  |  |  |
| *f* |  |  | *(-4, 0) and(6,0)* | *( , 10)* |  |
| *g* | *y = x2 + 6x - 16* |  |  |  |  |
| *h* |  |  | *(5, 0) and ( , )* | *(1, -16)* |  |
| *i* | *y = x2 - 25* |  |  |  |  |
| *j* |  | *y=(x - 3)2* |  |  |  |

1. Express each equation in standard form.

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1. The graph of a quadratic relation has zeros at (2,0) and (-6,0) and passes through the point (3,5). Write the equation that models this relation. What is its vertex?
2. The x-intercepts of a parabola are -3 and 5. The parabola crosses the y-axis at -75. Determine the coordinates of the vertex.
3. The graph of  is translated so that its new zeros are -4 and 2. Determine the translation that was applied to the original graph.

Homework: p. 288 #1ac, 2ac, 3bd, 4ac, 7ac, 9, 10