1.1/ 1.2 GRAPHING QUADRATIC FUNCTIONS

OBJECTIVE: To be able to graph quadratic functions in standard form, vertex form, and intercept form.

\*QUADRATIC FUNCTION: y = ax² + bx + c where a ≠ 0.

🡪the graph is U shaped called a **parabola**.

🡪the **vertex** is the highest or lowest point on the graph.

🡪the graph is symmetric about a vertical line, called the **axis of symmetry**.

☺GRAPHING A QUADRATIC FUNCTION IN **STANDARD FORM**:

🡪If a > 0 (positive), the graph opens up.

🡪If a < 0 (negative), the graph opens down.

🡪The x-coordinate of the vertex is –b .

2a

🡪The axis of symmetry is x = –b .

2a

🡪The pattern of points from the vertex is: over 1, up/down 1a

over 1, up/down 3a

over 1, up/down 5a…

EXAMPLE #1: Graph.

#1: #2: #3:

a) y=x2 -4x +3 b) y= -3x2 + 4

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Application:

A go-cart track has about 380 racers per week and charges each racer $35 to race. The owner estimates that there will be 20 more racers per week for every $1 reduction in the price per racer. How can the owner of the go-cart track maximize weekly revenue?

Define Variables: x represents the price reduction and R(x) represents weekly revenue.

Revenue=Price x Attendance1.2 ☺GRAPHING A QUADRATIC FUNCTION IN **VERTEX FORM**:

🡪 y = a(x – h)² + k

🡪the vertex is (h, k) (\*opposite sign inside the parentheses)

🡪the axis of symmetry is x = h.

EXAMPLE #2: Graph.

#1: #2: #3:

1. y= - (x + 4)2 -1 b) y= ½ (x – 2)2 -5

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☺GRAPHING A QUADRATIC FUNCTION IN **INTERCEPT FORM**:

🡪 y = a(x – p)(x – q)

🡪the x-intercepts are p and q.

🡪the axis of symmetry is halfway between the x-intercepts.

EXAMPLE #3: Graph.

#1:

#2:

#3:

#4:

1. y= 1/3 (x+2)(x-4) b) y= -2x(x+4)

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☺ WRITING A QUADRATIC IN STANDARD FORM: Use FOIL.

EXAMPLE #4: Write the equation in standard form.

1. y= (x-3)2 +2 b) y= -3(x-1)(x-3)
2. y= 2 (x+1)2 -4 d) y= - (x+2)(x-5)