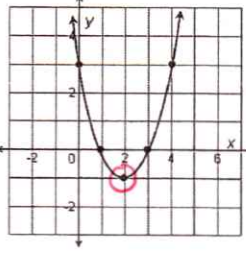
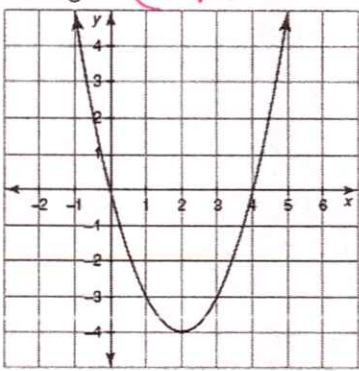
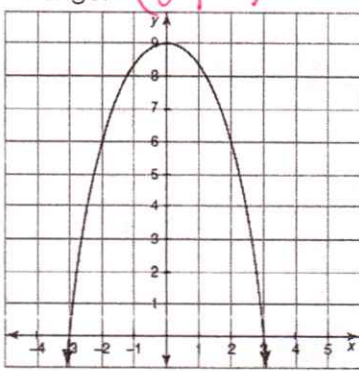
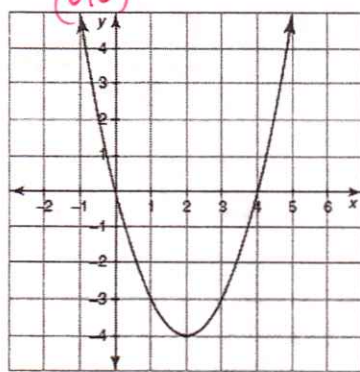
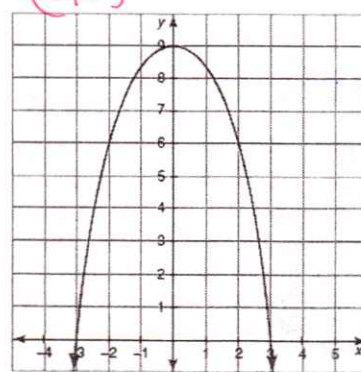
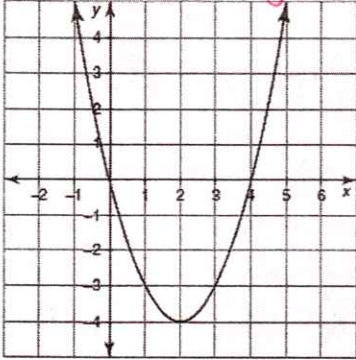
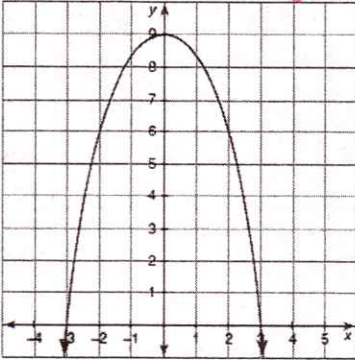
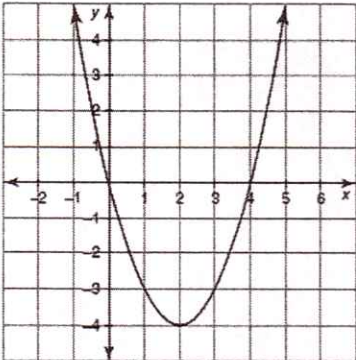
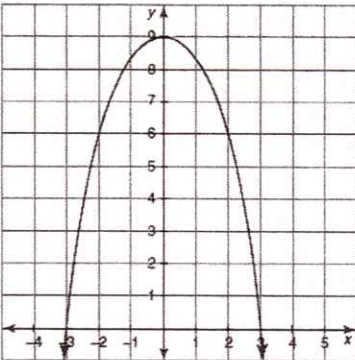
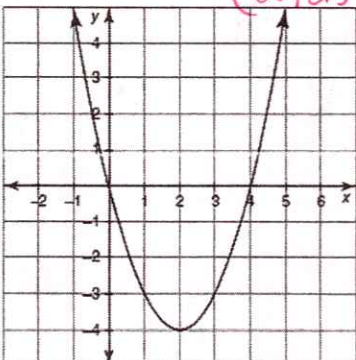
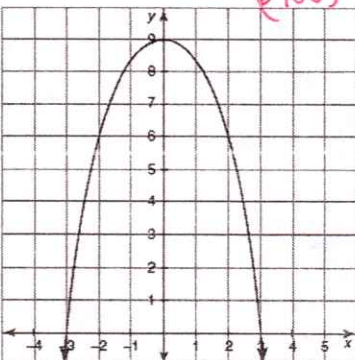
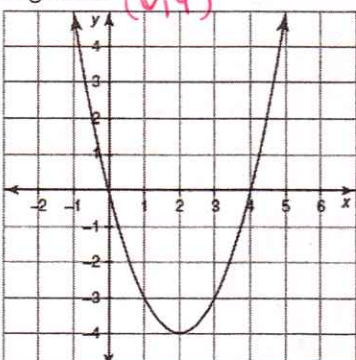
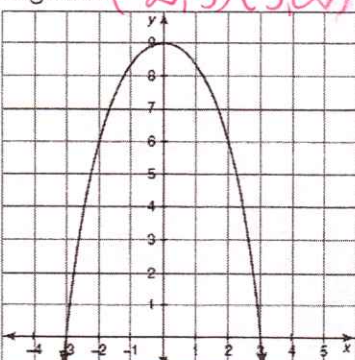
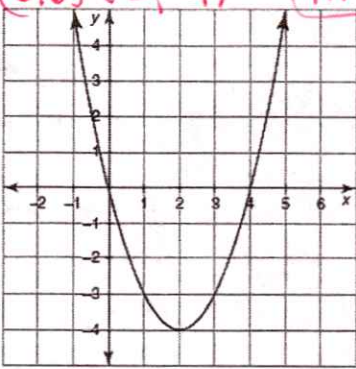
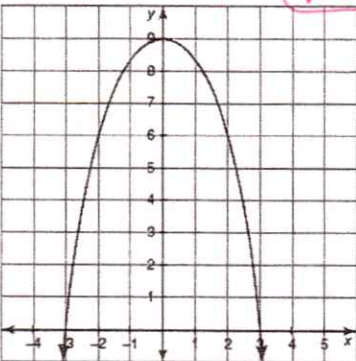
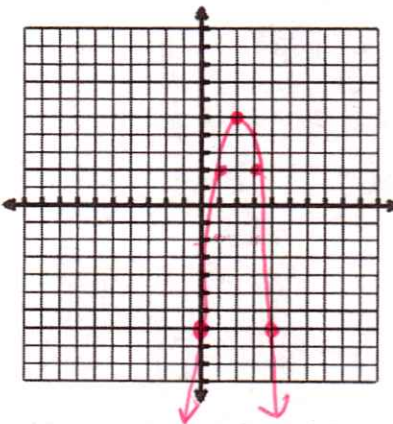
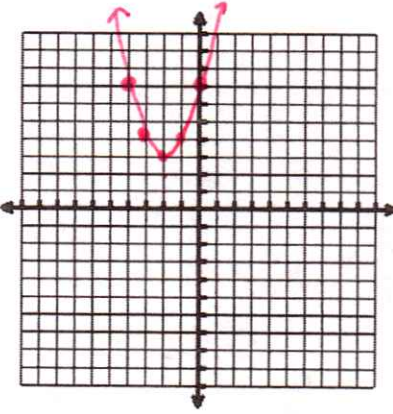
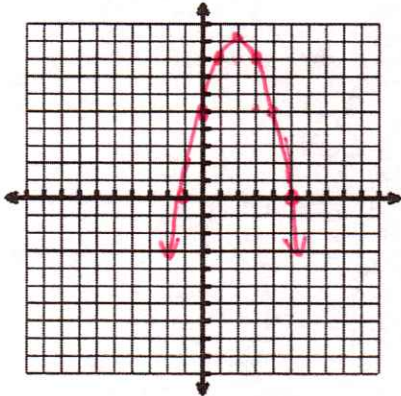


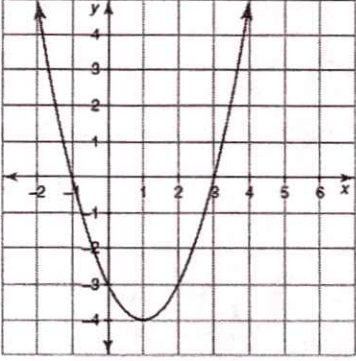
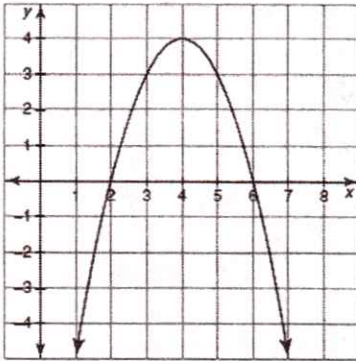
Must show work
For full credit

| What you need to know & be able to do | Things to remember | Examples | |
|---|---|---|---|
| 1. Describe transformations from an equation or graph | $y = a(x - h)^2 + k$ a: stretches/shrinks & reflects h: shifts left & right k: shifts up & down vertex: (h, k) | a. Describe the transformations and name the vertex: $y = -2(x + 3)^2 - 9$ $a = -$ reflect $a = 2$ stretch $h = -3$ shift left $k = -9$ shift down | a. Describe the transformations and name the vertex:  $v: (2, -1)$ right 2 down 1 |
| 2. Create a function using transformations | Determine your, a, h, and k values | a. Opens down, shifts up 3 units and shrinks by $\frac{1}{4}$ $a = \frac{1}{4}$ $h = 0$ $k = 3$ $y = -\frac{1}{4}x^2 + 3$ | b. Shifts left 5 and reflects across the x-axis $a = -$ $h = -5$ $k = 0$ $y = -(x + 5)^2$ |
| 3. Describe the domain and range. | -Domain: all possible values for x -Range: all possible values for y -"How far up or down does your graph go?" -written as an inequality | a. Domain: $(-\infty, \infty)$ Range: $(-4, \infty)$  | b. Domain: $(-\infty, \infty)$ Range: $(-\infty, 9)$  |
| 4. Describe the intercepts and zeros. | Zeros and x-intercepts are the same thing. Zeros: $x = \underline{\hspace{2cm}}$ X-int: (p, 0) (q, 0) Y-int: (0, c) | a. x-intercepts: $(0, 0)$ $(4, 0)$ zeros: $x = 0, x = 4$ y-intercept: $(0, 0)$  | b. x-intercepts: $(-3, 0)$ $(3, 0)$ zeros: $x = -3, x = 3$ y-intercept: $(0, 9)$  |

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| <p>5. Describe the vertex, axis of symmetry, extrema, and min/max values.</p> | <p>Vertex: highest or lowest point</p> <p>Axis of Symmetry: x value of the vertex; written as $x =$</p> <p>Extrema: Max or Min?</p> <p>Max/Min Value: What's the lowest or highest your graph goes; written as $y =$</p> | <p>a. Vertex: $(2, -4)$</p> <p>Axis of Sym: $x = 2$</p> <p>Extrema: min</p> <p>Max/Min Value: $y = -4$</p>  | <p>b. Vertex: $(0, 9)$</p> <p>Axis of Sym: $x = 0$</p> <p>Extrema: max</p> <p>Max/Min Value: $y = 9$</p>  |
| <p>6. Describe the end behavior.</p> | <p>Which direction are the ends of the graph headed? To positive or negative infinity?</p> | <p>a. As $x \rightarrow -\infty$, $f(x) \rightarrow \infty$.</p> <p>As $x \rightarrow \infty$, $f(x) \rightarrow \infty$.</p>  | <p>b. As $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$.</p> <p>As $x \rightarrow \infty$, $f(x) \rightarrow -\infty$.</p>  |
| <p>7. Describe the intervals of increase or decrease.</p> | <p>Draw your axis of symmetry and create an inequality to represent to the left and right of the axis of symmetry.</p> <p>Then determine which direction the graph is going on the left and then on the right using your inequalities.</p> | <p>a. Interval of Increase: $(2, \infty)$</p> <p>Interval of Decrease: $(-\infty, 2)$</p>  | <p>b. Interval of Increase: $(-\infty, 0)$</p> <p>Interval of Decrease: $(0, \infty)$</p>  |
| <p>8. Describe the positive and negative parts of the graph</p> | <p>Determine which parts of the graph are above or below the x-axis.</p> <p>Use inequalities to describe the different regions using the x-intercepts.</p> | <p>a. Positive: $(-\infty, 0) (4, \infty)$</p> <p>Negative: $(0, 4)$</p>  | <p>b. Positive: $(-3, 3)$</p> <p>Negative: $(-\infty, -3) (3, \infty)$</p>  |

| | | | |
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| <p>9. Find the average rate of change given a graph</p> | <p>-Determine your two x-values and find their corresponding y-values on the parabola.</p> <p>-Calculate the rate of change (rise over run)</p> | <p>a. On interval from $0 \leq x \leq 2$:</p> <p>$(0,0)$ $(2,-4)$ $m=-2$</p>  | <p>b. On interval from $-3 \leq x \leq 0$:</p> <p>$(-3,0)$ $(0,9)$ $m=3$</p>  |
| <p>10. Find the average rate of change given an equation</p> | <p>Find two points (by substituting x-values into the equation to get your y-values.</p> <p>Then use slope formula</p> | <p>a. Calculate the average rate of change for $y = x^2 + 1$ on the interval $0 \leq x \leq 2$.</p> <p>$m=2$</p> | |
| <p>11. Graph in vertex form</p> | <ol style="list-style-type: none"> Determine your vertex. Create a table with 2 values to the left and right of the vertex. Graph. | <p>a. Graph the following equation: $y = -3(x-2)^2 + 5$</p>  | |
| <p>12. Graph in standard form</p> | <ol style="list-style-type: none"> Determine your vertex $\left(x = \frac{-b}{2a}\right)$. Create a table with 2 values to the left and right of the vertex. Graph. | <p>a. Graph the following equation: $y = x^2 + 4x + 7$</p>  | |

| | | | |
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| <p>13. Graph in factored form</p> | <p>1. Determine your x-intercepts and plot them.</p> <p>2. Determine you vertex (find the middle of the two x-intercepts or use $x = \frac{p+q}{2}$).</p> <p>3. Plot vertex and graph.</p> | <p>a. Graph the following equation: $y = -(x+1)(x-5)$</p>  | |
| <p>14. Different Forms of Quadratics</p> | <p>Vertex Form: $y = a(x-h)^2 + k$ (h, k) is vertex</p> <p>Standard Form: $y = ax^2 + bx + c$ (0, c) is y-intercept</p> <p>Factored Form: $y = a(x-p)(x-q)$ (p, 0) & (q, 0) are x-intercepts</p> <p>A determines if graph opens up or down</p> | <p>a. Determine the form and associated characteristics: $y = 2(x+4)(x-3)$</p> <p>intercept Given: x-int.</p> | <p>b. Determine the form and associated characteristics: $y = (x-5)^2 + 9$</p> <p>Vertex Given: vertex</p> |
| <p>15. Converting between forms</p> <p>Use your Converting Between Forms graphic organizer.</p> | | <p>c. Determine the form and associated characteristics: $y = -x^2 + 6x - 1$</p> <p>Standard Given: y-int</p> | <p>d. Determine the form and associated characteristics: $y = -(x+2)^2$</p> <p>vertex Given: vertex</p> |
| | | <p>a. What characteristics can you describe in $y = (x+4)(x-7)$?</p> <p>x-intercept</p> <p>Convert to standard form. What new characteristic can you give?</p> <p>$y = x^2 - 3x - 28$</p> <p>y-int</p> | <p>b. What characteristics can you describe in $y = (x+3)^2 - 5$</p> <p>Vertex</p> <p>Convert to standard form. What new characteristic can you give?</p> <p>$y = x^2 + 6x + 4$</p> <p>y-int.</p> |
| | | <p>c. What characteristics can you describe in $y = x^2 + 6x + 4$</p> <p>y-int.</p> <p>Convert to vertex form. What new characteristic can you give?</p> <p>$y = (x+3)^2 - 5$</p> <p>vertex</p> | <p>d. What characteristics can you describe in $y = x^2 - 5x - 24$</p> <p>y-int.</p> <p>Convert to factored form. What new characteristic can you give?</p> <p>$y = (x-8)(x+3)$</p> |

| | | | |
|--|--|--|--|
| 16. Create equations given characteristics | Determine the best form to represent the given characteristics | <p>a. Given: X-intercepts of (7, 0) and (-8, 0) and graph opens up</p> <p>intercept form</p> | <p>b. Given: Vertex of (-3, -6) and graph has a maximum</p> <p>vertex form</p> |
| 17. Create equations given graphs | | <p>a.</p>  <p>Vertex Form: $y = (x-1)^2 - 4$</p> <p>Intercept Form: $y = (x+1)(x-3)$</p> <p>Standard Form: $y = x^2 - 2x - 3$</p> | <p>b.</p>  <p>Vertex Form: $y = -(x-4)^2 + 4$</p> <p>Intercept Form: $y = -(x-2)(x-6)$</p> <p>Standard Form: $y = -x^2 + 8x - 12$</p> |
| 18. Applications of the Vertex | <p>Maximum/Minimum indicate finding the vertex.</p> <p>Describe what you know about your equation before completing any solving.</p> <p>Interpret the vertex in terms of what x and y represent.</p> | <p>a. The height in feet of a rocket after x second is given by $y = -16x^2 + 128x$. What is the maximum height reached by the rocket and how long does it take to reach that height?</p> <p>height $\rightarrow 256'$</p> <p>time $\rightarrow 4 \text{ sec.}$</p> | <p>b. The arch of bridge is modeled by the equation $y = -\frac{1}{4}(x-50)^2 + 95$, where x represent the horizontal distance (in feet) and y represents the vertical distance (in feet). What is the maximum height of the arch?</p> <p>95'</p> |

c.
 You run a canoe rental business on a small river in Georgia. You currently charge \$12 per hour canoe and average 36 rentals a day. An industry journal says that for every fifty cent increase in rental price, the average business can expect to lose two rentals a day.

a. Use this information to attempt to maximize your income. What should you charge?

| Price | Number of Rentals | Revenue |
|-------|-------------------|---------|
| | | |
| | | |
| \$12 | 36 | |
| | | |
| | | |
| | | |
| | | |
| | | |

19. Comparing Quadratic Functions

a. Which representation has the greater y-intercept:

A. $y = x^2 + 6x - 2$

B.

| | | | | | |
|---|----|----|----|----|----|
| X | -3 | -2 | -1 | 0 | 1 |
| Y | -2 | -5 | -6 | -5 | -2 |

C. $y = (x + 3)(x - 1)$

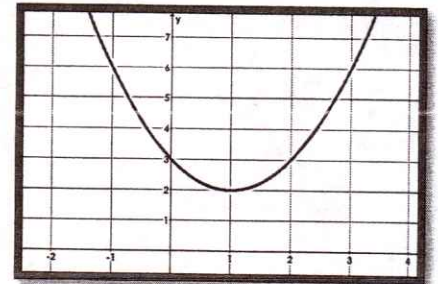
A

b. What representation has the smallest minimum value?

A.

| | | | | |
|---|----|----|----|----|
| X | -1 | 0 | 1 | 2 |
| y | 1 | -2 | -3 | -2 |

B.



C. $y = x^2 - 2x + 6$

A