| Explo | | Date: Hour: | |
|-------|---|-----------------------------|----------------------|
| 1) | On your graphing calculator graph the f | function $f(x) = x^2$. | |
| | a. Identify the vertex. | | a) |
| | b. Identify the line of symmetry. | | b) |
| | c. Does the graph open up or down? | | c) |
| 2) | On your graphing calculator graph the f | function $f(x) = (x - 3)^2$ | ² + 4 |
| | a. Identify the vertex. | | a) |
| | b. Identify the line of symmetry. | | b) |
| | c. Does the graph open up or down? | | c) |
| | d. Did the graph move left or right whe | en compared to $f(x) =$ | x²? How far? d) |
| | e. Did the graph move up or down whe | en compared to f(x) = | = x²? How far? e) |
| 3) | On your graphing calculator graph the f | function $f(x) = -(x + 2)$ |) ² + 6 |
| | a. Identify the vertex. | | a) |
| | b. Identify the line of symmetry. | | b) |
| | c. Does the graph open up or down? | | c) |
| | d. Did the graph move left or right whe | en compared to f(x) = | x²? How far? d) |
| | e. Did the graph move up or down whe | en compared to f(x) = | = x²? How far? e) |
| | | | |

| | On your graphing calculator graph the function | $f(x) = 3(x+1)^2 - 2.$ |
|--|---|--|
| | a. Identify the vertex. | a) |
| | b. Identify the line of symmetry. | b) |
| | c. Does the graph open up or down? | c) |
| | d. Did the graph move left or right when com | pared to f(x) = x²? How far? d) |
| | e. Did the graph move up or down when com | pared to f(x) = x ² ? How far? e) |
| 5) | On your graphing calculator graph the function | $f(x) = -4(x - 5)^2 + 1$ |
| | a. Identify the vertex. | a) |
| | b. Identify the line of symmetry. | b) |
| | c. Does the graph open up or down? | c) |
| | d. Did the graph move left or right when com | pared to f(x) = x ² ? How far? |
| | e. Did the graph move up or down when com | pared to f(x) = x ² ? How far? e) |
| 6) | Given the graph and table below, write a funct | ion of this graph in vertex form, |
| | $f(x) = a(x - h)^2 + k.$ | |
| ∢ 1.1 | $f(x) = a(x - h)^2 + k.$ $1.2 1.3 * \text{Unsaved} \blacksquare \blacksquare \blacksquare$ | |
| 1.1 | $f(x) = a(x - h)^{2} + k.$ $1.2 1.3 * Unsaved \blacksquare \blacksquare \blacksquare$ $grid \qquad $ | Input output 0 19 |
| 1.1 | $f(x) = a(x - h)^2 + k.$ | Input output 0 19 1 12 2 7 |
| 1.1 <i>−10</i> | $f(x) = a(x - h)^2 + k.$ | Input output 0 19 1 12 2 7 3 4 4 3 |
| 1.1 710 | $f(x) = a(x - h)^{2} + k.$ | Input output 0 19 1 12 2 7 3 4 4 3 5 4 |
| 1.1 7.10 7.10 7.10 7.10 | $f(x) = a(x - h)^{2} + k.$ | Input output 0 19 1 12 2 7 3 4 4 3 5 4 6 7 |
| 1.1 -10 -30 -30 | $f(x) = a(x - h)^{2} + k.$ | Input output 0 19 1 12 2 7 3 4 4 3 5 4 6 7 |
| 1.1 -10 -0 <l< td=""><td>$f(x) = a(x - h)^2 + k.$</td><td>Input output 0 19 1 12 2 7 3 4 4 3 5 4 6 7</td></l<> | $f(x) = a(x - h)^2 + k.$ | Input output 0 19 1 12 2 7 3 4 4 3 5 4 6 7 |

7) Given the graph and table below, write a function of this graph in vertex form, $f(x) = a(x - h)^2 + k$.



| Input | Output |
|-------|--------|
| -4 | 7 |
| -3 | 2 |
| -2 | -1 |
| -1 | -2 |
| 0 | -1 |
| 1 | 2 |
| 2 | 7 |

- 7)
- 8) Given the graph and table below, write a function of this graph in vertex form, $f(x) = a(x h)^2 + k$.

| ∢ | 1 | .1 | D | 2 | 1 | I.3 | Þ | , | *Un: | save | , k | • | | | | | 8 | ÌX |
|--------|------------|------------|----|----|----|-----|----|-----|------|-------|-----|----|----|----|-----|----|----|-----|
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| > | ¢ | \$ | | \$ | \$ | \$ | \$ | \$ | 0 | ł • | \$ | \$ | \$ | \$ | 0 | \$ | \$ | * |
| > | ÷ | \$ | * | \$ | \$ | \$ | \$ | \$ | \$ | ł • | \$ | \$ | \$ | \$ | \$ | \$ | \$ | * |
| > | ¢ | ¢ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | ł • | \$ | \$ | \$ | \$ | \$ | \$ | \$ | * |
| > | ¢ | \$ | \$ | \$ | \$ | \$ | ÷ | \$ | \$ | ł • | \$ | ۰. | ~ | * | \$ | \$ | \$ | * |
| > | ÷ | ÷ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | ł • | \$ | 1 | * | * | \$ | \$ | \$ | * |
| > | ¢ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | ł • | \$ | | \$ | ٦. | \$ | \$ | \$ | * |
| | \diamond | \diamond | \$ | \$ | \$ | \$ | \$ | ¢ | ۰. | ł • | * | £. | \$ | -1 | * | \$ | \$ | * |
| > | ¢ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | ۰X | † ° | ÷. | F* | \$ | ~ | * | \$ | \$ | ° x |
| | i a | | | | | | | | | | -7 | ┝┷ | | | ┢─ | | | 1 |
| \sim | w | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | † £ . | 1 | \$ | \$ | \$ | Ł | \$ | \$ | 40 |
| | \$ | \$ | * | \$ | * | * | * | \$ | \$ | † ° | 3 | * | \$ | \$ | ٩. | * | * | * |
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| > | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | † ° . | • | \$ | \$ | \$ | ~ | * | \$ | * |
| > | ¢ | \$ | * | \$ | \$ | * | \$ | \$ | \$ | t °i | ÷ | * | \$ | \$ | ÷1 | ÷ | \$ | * |
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| 0 | 2 | \$ | \$ | \$ | \$ | \$ | ٠ | ÷ 7 | -10 | 1 1 | \$ | \$ | \$ | \$ | \$ | ÷ | \$ | * |

| Input | Output |
|-------|--------|
| 0 | -27 |
| 1 | -13 |
| 2 | -3 |
| 3 | 3 |
| 4 | 5 |
| 5 | 3 |
| 6 | -3 |

8) _____

Given the graph and table below, write a function of this graph in vertex form, $f(x) = a(x - h)^2 + k$.

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| > | \$ | \$ | \$ | ¢ | ÷ | \$ | ٠ | ÷ | Λ | ł • | \$ | \$ | \$ | \$ | ¢ | \$ | \$ | \$ |
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| Þ | ¢ | \$ | \$ | \$ | \$ | \$ | ¢ | - 25 | * | 4 • | \$ | \$ | \$ | \$ | ¢ | \$ | 0 | 0 |
| > | \$ | \$ | \$ | \$ | \$ | \$ | ٠ | • | * | * | \$ | \$ | \$ | \$ | ¢ | \$ | \$ | ۰ |
| > | ÷ | \$ | \$ | \$ | ÷ | \$ | ÷ | | ÷ | × | \$ | \$ | \$ | \$ | ÷ | \$ | \$ | * |
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| > | \$ | \$ | \$ | 0 | \$ | \$ | * | ÷ | ۰ĩ | í∎ °. | ¢ | \$ | \$ | \$ | \$ | \$ | \$ | ° r |
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| > | \$ | \$ | \$ | 0 | \$ | \$ | 4 | \$ | \$ | ł | \$ | \$ | \$ | \$ | \$ | \$ | 0 | 0 |
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| > | ¢ | \$ | \$ | \$ | ¢ | \$ | 1 | \$ | \$ | ł 1 | \$ | \$ | \$ | \$ | ¢ | \$ | \$ | \$ |
| í. | 2 | \diamond | ¢ | ¢ | \diamond | \$ | ſ | ¢ | i. | ł 1 | \diamond | \diamond | \$ | ¢ | \diamond | \$ | \$ | \$ |
| 6 | 2 | \$ | \$ | \$ | \$ | \$ | ſ | ÷ " | -10 | ł 1 | \$ | \$ | \$ | \$ | \$ | \$ | \$ | 0 |

9)

| Output |
|--------|
| -28 |
| -8 |
| 4 |
| 8 |
| 4 |
| -8 |
| -28 |
| |

9) _____

Adapted from Holt High School Mathematics Department