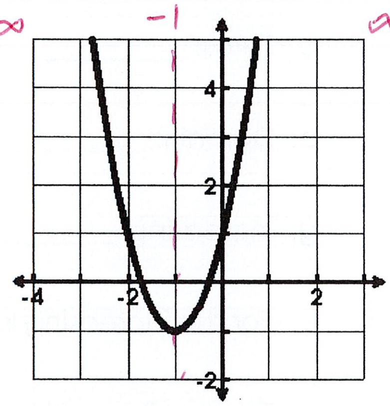
GSE Algebra I Unit 3 3.05 – Homework

Name: Guide Date: ____________

Characteristics of Functions

1. $f(x) = 2x^2 + 4x + 1$



a. Domain: $(-\infty, \infty)$ b. Range: $[-1, \infty)$

c. Extrema: Min $(-1, -1)$ d. Zeros: $x = -.3, -1.7$

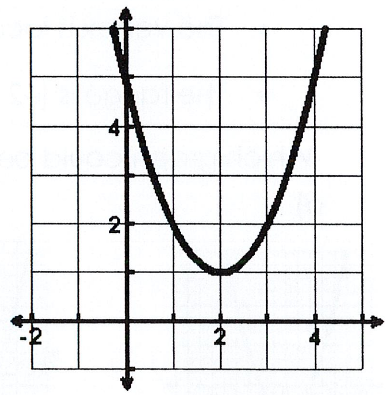
e. Increasing: $(-1, \infty)$ f. Decreasing: $(-\infty, -1)$

g. End Behavior: $x \to \infty$, $y \to \infty$

$x \to -\infty$, $y \to \infty$

h. Average rate of change $[0,2]$ $\frac{17-1}{2-0} = \frac{16}{2} = 8$

2. $f(x) = (x-2)^2 + 1$



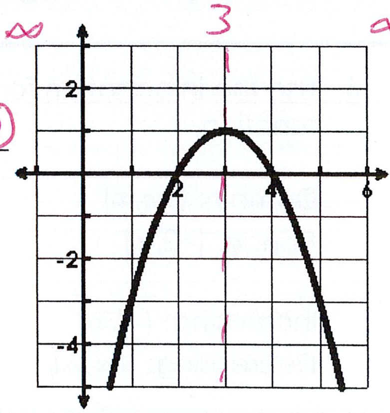
a. Range: ________ b. Y-intercept: ________

c. Extrema: ________ d. Axis of Sym: ________

e. Increasing: ________ f. Decreasing: ________

g. Average rate of change $[0,2]$ ________

3. $f(x) = -(x-2)(x-4)$



a. Domain: $(-\infty, \infty)$ b. Range: $(-\infty, 1]$

c. Axis of Sym: $x = 3$ d. x - intercepts: $(2,0)$ $(4,0)$

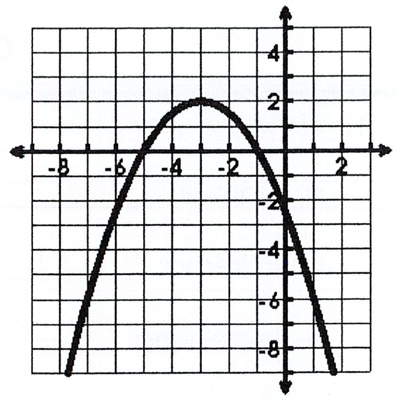
e. Increasing: $(-\infty, 3)$ f. Decreasing: $(3, \infty)$

g. End Behavior: $x \to \infty$, $y \to -\infty$

$x \to -\infty$, $y \to -\infty$

h. Average rate of change $[0,2]$ $\frac{0-(-8)}{2-0} = \frac{8}{2} = 4$

4. This graph represents a quadratic function.



a. Extrema: __________ b. Axis of Sym: __________

c. Zeros: __________ d. y-intercept: __________

e. Domain: __________ f. Range: __________

g. Increasing: __________ h. Decreasing: __________

i. For the increasing interval, is the rate of change increasing or decreasing?

j. For the decreasing interval, is the rate of change increasing or decreasing?

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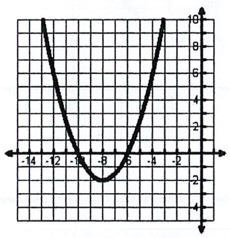
5. The quadratic function $f(x)$ has these characteristics:

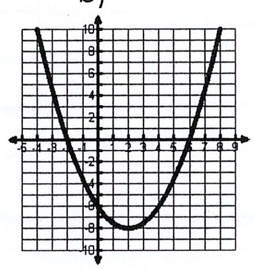
- The vertex is located at $(8, -2)$.
- The range is $[-2, \infty)$.

Which graph could be $f(x)$?

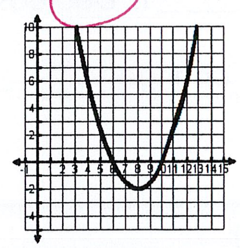
a)



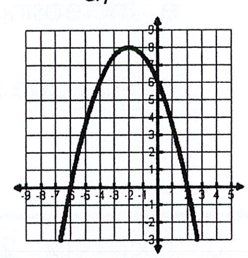
b)



c)



d)



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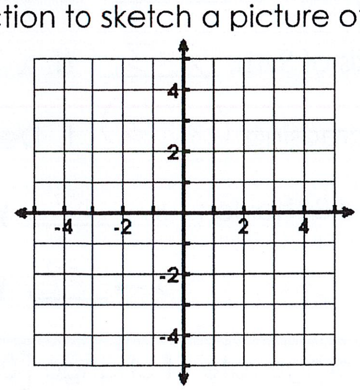
6. Use the information for a given quadratic function to sketch a picture of the function.



Domain: $(-\infty, \infty)$
Range: $[-2, \infty)$

Increasing: $(-1, \infty)$
Decreasing: $(-\infty, -1)$

There is no stretch or shrink ($a = 1$)