

INTERMEDIATE ALGEBRA

GPS # 38

8.2 PARABOLAS AND MODELING

NAME:

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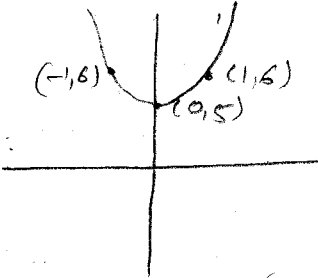
Useful Guidelines:

* $f(x) = x^2 + k$: A parabola with the same shape as the graph of $f(x) = x^2$. The parabola is shifted vertically k units up if $k > 0$ or k units down if $k < 0$; Vertex: $(0, k)$.

* $f(x) = (x - h)^2$: A parabola with the same shape as the graph of $f(x) = x^2$. The parabola is shifted horizontally h units to the right if $h > 0$ or h units to the left if $h < 0$; Vertex: $(h, 0)$.

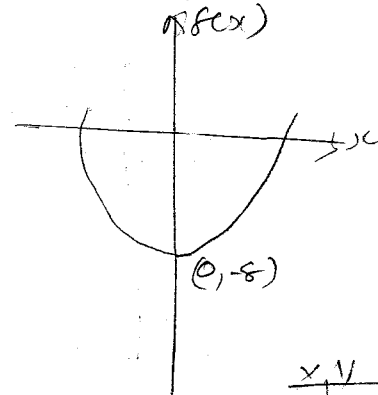
Graph each parabola. Plot at least two points in addition to the vertex. Give the vertex, axis, domain, and range.

1. a) $f(x) = x^2 + 5$



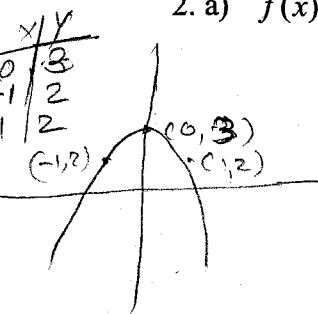
Vertex = $(0, 5)$
 $D = (-\infty, \infty)$
 $R = [5, \infty)$
 Axis of Symmetry $x = 0$

b) $f(x) = x^2 - 8$



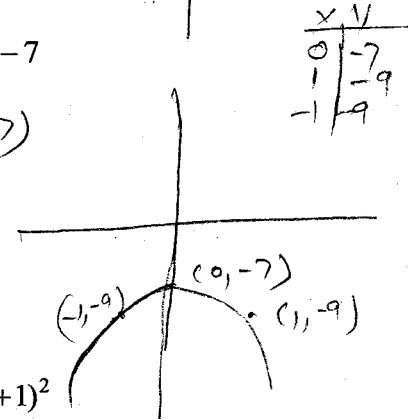
Vertex = $(0, -8)$
 $D = (-\infty, \infty)$
 $R = [-8, \infty)$

2. a) $f(x) = -x^2 + 3$



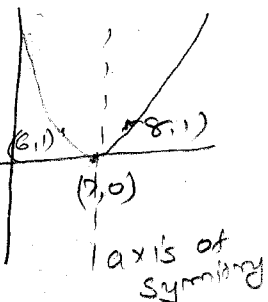
Vertex $(0, 3)$
 $D = (-\infty, \infty)$
 $R = (-\infty, 3]$

b) $f(x) = -2x^2 - 7$



Vertex = $(0, -7)$
 $D = (-\infty, \infty)$
 $R = (-\infty, -7]$

3. a) $f(x) = (x - 7)^2$ as $f(x) > 0$ so \cup

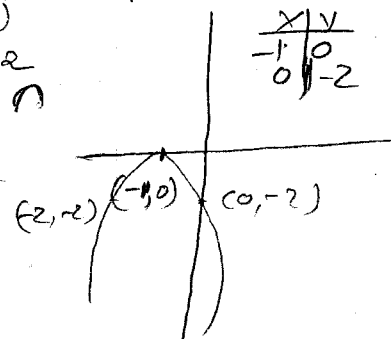


$(x-7)(x-7) = x^2 - 14x + 49$

x	f(x)
7	0
6	1
8	1

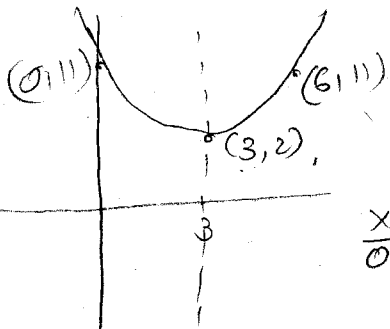
 Vertex: $(7, 0)$
 $D = (-\infty, \infty)$
 $R = [0, \infty)$
 Axis: $x = 7$

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



$= -2(x^2 + 2x + 1)$
 $= -2x^2 - 4x - 2$
 $a = -2$ going \cap
 $b = -4$
 $c = -2$
 Vertex $(-1, 0)$
 $D = (-\infty, \infty)$
 $R = (-\infty, 0]$
 Axis $x = -1$

4. a) $f(x) = (x - 3)^2 + 2$



Vertex $(3, 2)$
 $D = (-\infty, \infty)$
 $R = [2, \infty)$
 Axis $x = 3$

x	y
0	11

Vertex: $(1, -1)$
 $D = (-\infty, \infty)$
 $R = [-1, \infty)$
 Axis $x = 1$

