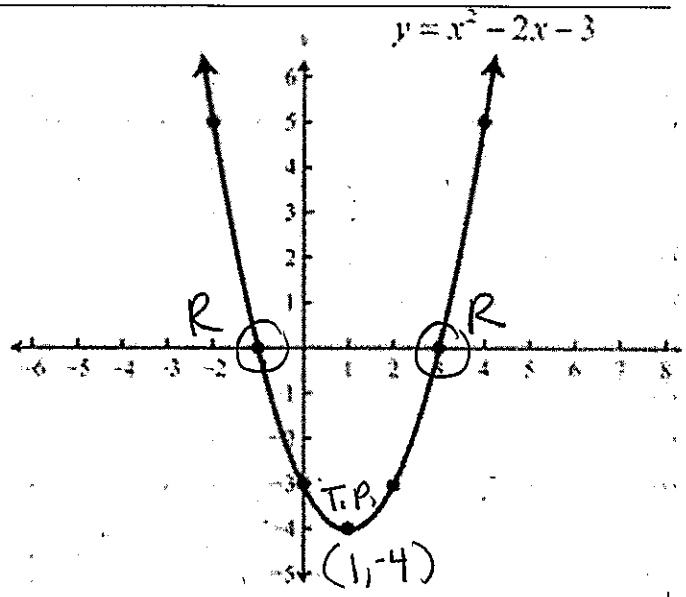
Name Key
Unit 9

Date
Lesson 1

DO NOW

1. Given the parabola to the right answer the following.



a) Is the parabola concave up ("smiling") or concave down ("frowning")?

concave up

b) Identify the roots.

$\{-1, 3\}$

c) Identify the y-intercept.

-3

d) Does the parabola have a maximum or minimum point?

min.

e) Identify the Turning Point.

$(1, -4)$

f) Identify the Axis of Symmetry.

$x = 1$

g) For which interval is quadratic function increasing?

$(1, \infty)$

h) For which interval is quadratic function decreasing?

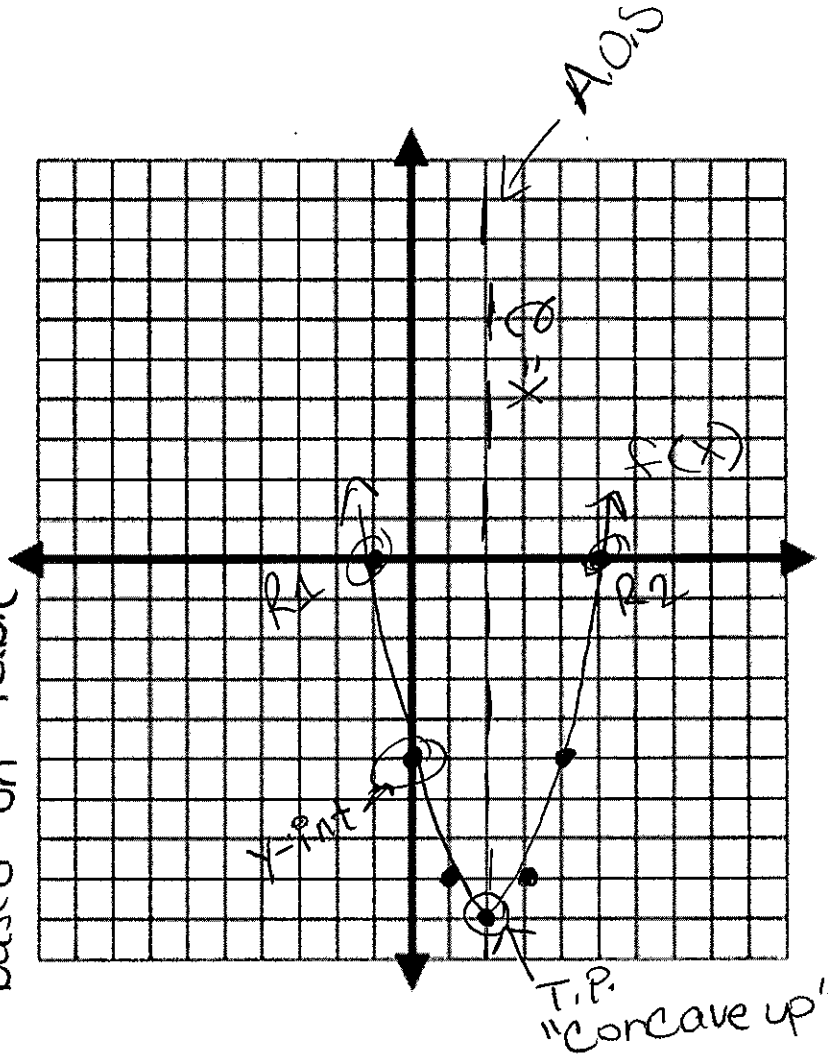
$(-\infty, 1)$

AIM: GRAPHING QUADRATIC EQUATIONS = y (graph)

- The standard form of a quadratic equation (graph) is $ax^2 + bx + c = 0$
- The graph of a quadratic equation is called a parabola.
- When the a-value is positive, the parabola opens up and has a minimum TP.
- When the a-value is negative, the parabola opens down and has a maximum TP.
- The c - value is the y-intercept.
- The axis of symmetry always goes through the T.P. and the equation is $x = \#$ (↓ x-value of T.P.)
- When an interval is given, there are no arrows.
- There are 3 ways to find the roots:
  1) Solving — factor, quad. formula, complete the square
  2) X-intercepts on graph
  3) table → $y = 0$

2. Graph $f(x) = x^2 - 4x - 5$

x	y
-1	0
0	-5
1	-8
2	-9
3	-8
4	-5
5	0



answer questions based on table

a) y-intercept -5

b) Turning Point (2, -9)

c) Maximum or Minimum T.P min

d) x-intercepts {-1, 5}

e) Axis of Symmetry X = 2

f) State the domain set builder notation $\{-\infty < x < \infty\}$ OR $\{x \mid x \in \mathbb{R}\}$

g) State the range in set builder notation $\{-9 \leq x < \infty\}$ or $\{y \mid y \geq -9\}$

h) For which interval is quadratic function increasing? $(2, \infty)$

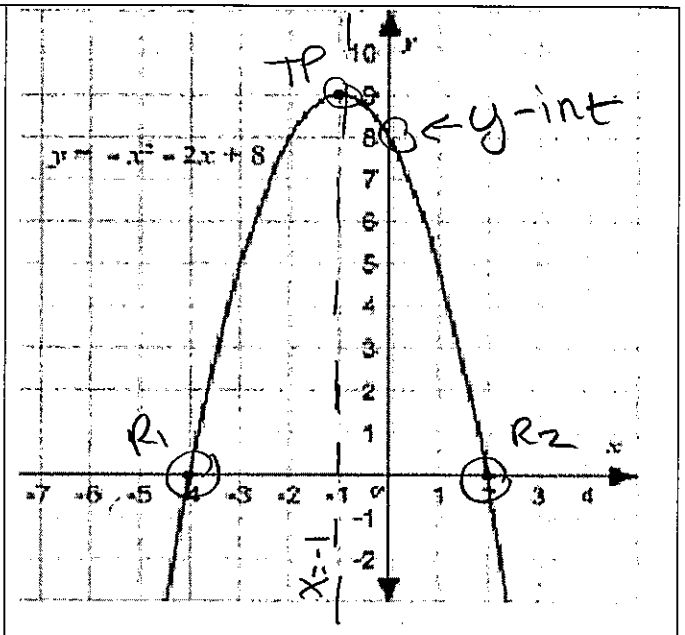
i) For which interval is quadratic function decreasing? $(-\infty, 2)$

GRAPHING CALCULATOR STEPS:

1) Press "y =" key and type in equation
2) Press "2nd graph (table)
3) Find turning point in the middle of table and copy at least 3 points above and 3 points below.
4) Plot the points, connect the curve, and label your graph.
5) Press "zoom" 6 or "graph" to check parabola

Partner Practice:

3. Given the parabola to the right answer the following.



a) Is the parabola concave up or concave down?

Concave down

b) Identify the zeros of a function.

{-4, 2}

c) Identify the y-intercept.

8

d) Does the parabola have a maximum or minimum point?

max

e) Identify the vertex.

(-1, 9)

f) Identify the Axis of Symmetry.

$x = -1$

g) For which interval is quadratic function increasing?

$(-\infty, -1)$

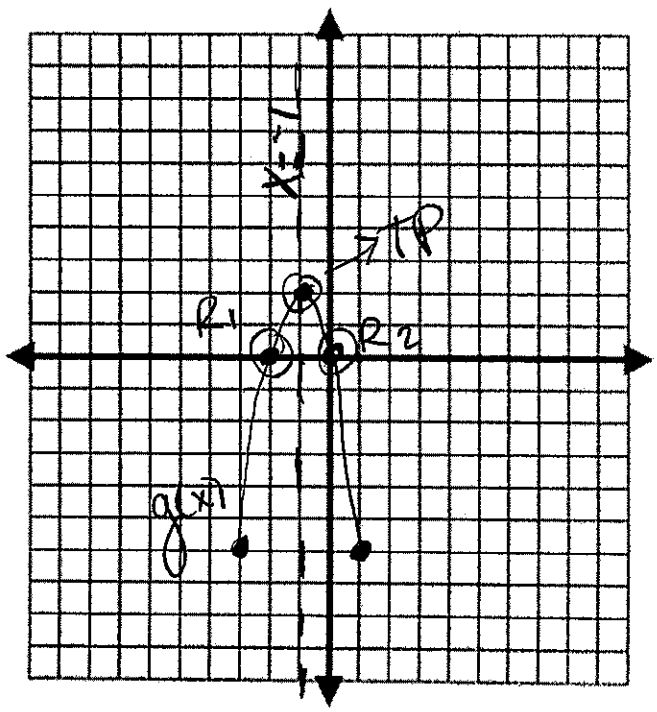
h) For which interval is quadratic function decreasing?

$(-1, \infty)$

4. Graph $g(x) = -2x^2 - 4x$; $\{-3 \le x \le 1\}$ ← NO ARROWS

x	y
-3	-6
-2	0
-1	2
0	0
1	-6

T.P



a) y-intercept 0

b) Vertex (-1, 2)

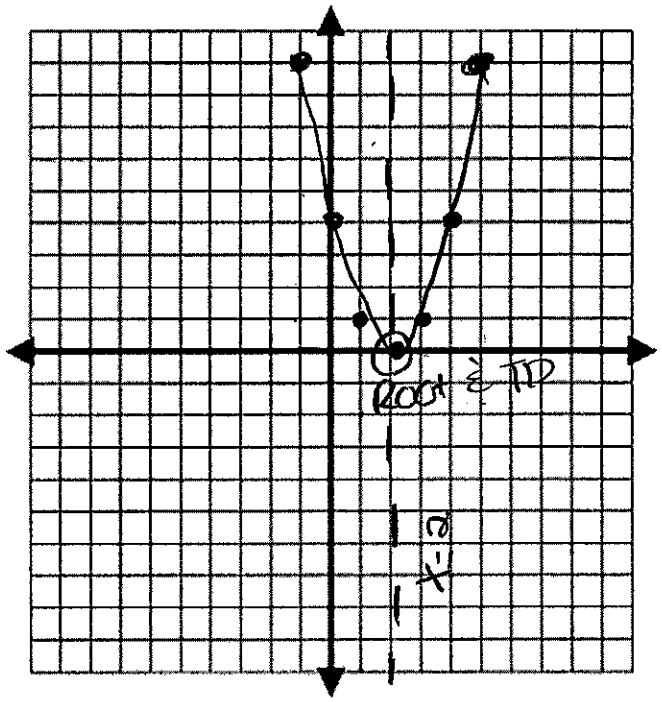
c) Maximum or Minimum T.P max

d) Roots {-2, 0}

e) Axis of Symmetry $x = -1$

5. Graph $h(x) = x^2 - 4x + 4$; $\{-1 \le x \le 5\}$ NO ARROWS

x	y
−1	9
0	4
1	1
2	0
3	1
4	4
5	9



a) y-intercept 4

b) Vertex (2, 0)

c) Maximum or Minimum T.P min

d) x-intercepts {2}

e) Axis of Symmetry x = 2