Name:_____

Honors Advanced Algebra

Key Concept 7—Systems and Comparing Functions—Study Guide

Solve the system using algebra.

1) $-2x + y = -1$

    $y = x^2 - x - 5$

2) $y = -x^2 + 4x + 5$

    $y = x^2 - 2x - 3$

Solve the system by graphing.

3) $y = -|x - 4| + 5$

    $y = \dfrac{1}{3}x + 1$

4) $y = |x + 4| - 2$

    $y = -x^2 - 6x - 8$

5) $y = 2^x - 1$

    $y = \dfrac{3}{2}x - 2$

Identify which type of model the data represents: linear, exponential, or quadratic. Explain your reasoning.

6)

x	y
-2	9
-1	7
0	5
1	3
2	1

7)

x	y
-2	12
-1	6
0	3
1	1.5
2	0.75

8)

x	y
0	1
1	1.5
2	3
3	5.5
4	9

9)

x	y
-2	$\frac{1}{50}$
-1	$\frac{1}{10}$
0	$\frac{1}{2}$
1	$\frac{5}{2}$
2	$\frac{25}{2}$

Determine which of the following features each function has and describe the feature on the function. For example, if the function has an x intercept, state where it's located too.
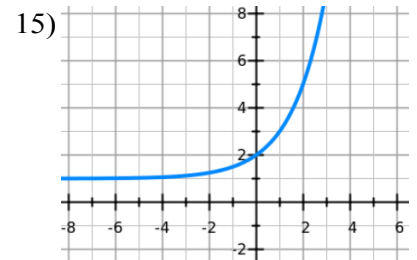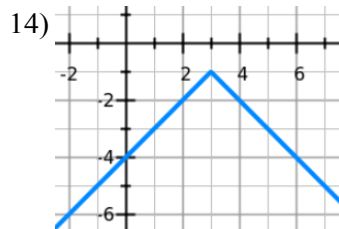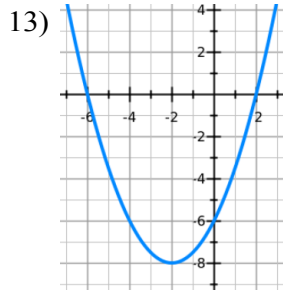
A) relative minimum   C) x-intercept   E) absolute minimum   G) domain of all real numbers
B) relative maximum   D) y-intercept   F) absolute maximum   H) range of all real numbers

10) $y = 3x^3 + 2x^2 - 19x + 6$

11) $3x + y = 6$

12) $y = x^4 - 5x^3 + 2x^2 + 8x$

13)

14)

15)

16) Jackie and Angie are bouncing rubber balls in the playground at school. Jackie throws her ball off the edge of a 2 foot at the same time Angie throws hers off the edge of a 10 foot platform. J(t) represents the height of the Jackie's ball and A(t) represents the height of Angie's ball , where t represents time in seconds in both functions. Assume $t \geq 0$ and that the balls fail to keep bouncing after they hit the ground for the first time.

$$J(t) = -16t^2 + 28t + 2 \qquad A(t) = -16t^2 + 14t + 10$$

A) Graph the function.

B) Do the rubber balls ever reach identical heights after the same number of seconds when leaving the platform? If so, after how many seconds and at what height does it happen?

C) Whose ball hits the ground first and by how many seconds?