Chapter 6 Quadratics Review Name Key

For questions 1-6, use the following equation: $f(x) = -x^2 - 2x + 3$

1) Find the axis of symmetry $x = -1$

2) Find the vertex $(-1, 4)$

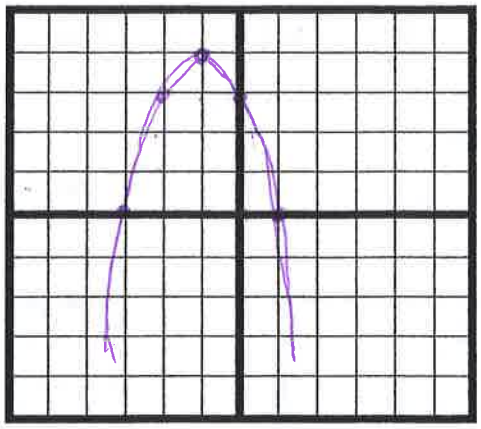
3) Find the y-intercept $(0, 3)$

4) State if the graph has a minimum or maximum value, then find the value. max $y = 4$ $(-1, 4)$

5) Find the solutions $x = 1, x = -3$

6) Make a table of values and graph the function.

x	y
-3	0
-2	3
-1	4
0	3
1	0



For questions 7 -10, use the following information. From 4 feet above a swimming pool, Susan throws a ball upward with a velocity of 32 feet per second.

7) The height h(t) of the ball t seconds after Susan throws it is given by what equation?

$h(t) = -16t^2 + 32t + 4$ $h(t) = -16t^2 + v_0 t + h_0$

8) Find the maximum height that the ball reaches. 20 ft

9) How long after the ball is release does it reach its maximum height? 1 sec.

10) How long does it take the ball to reach the pool? 2.12 sec.

For questions 11 - 14, solve each quadratic

11) $3x^2 - 15x = 0$

$3(x^2 - 5x) = 0$

$3x(x-5) = 0$

$3x = 0$ $x - 5 = 0$

$x = 0$ $x = 5$

12) $4x^2 - 25 = 0$ $a = 2x$ $b = 5$

$(a+b)(a-b)$

$(2x+5)(2x-5)$

$2x + 5 = 0$ $2x - 5 = 0$

$2x = -5$ $2x = 5$

$x = -5/2$ $x = 5/2$

13) $x^2 + x - 30 = 0$

$(x+6)(x-5)$

$x = -6$

$x = 5$

14) $8x^2 - 14x + 3 = 0$

$x^2 - 14x + 24 = 0$

$(x - \frac{12}{8})(x - \frac{2}{8})$

$(x - \frac{3}{2})(x - 1/4)$

$x = 3/2$

$x = 1/4$

Write each equation in vertex form and then identify the vertex, axis of symmetry, and the direction of the opening. Show all work.

15) $y = x^2 + 6x + 2$

$\frac{-b}{2a} = \frac{-6}{2(1)} = -3 = h$

$-3^2 + 6(-3) + 2 = -7 = k$

Vertex form $y = (x+3)^2 - 7$

Vertex $(-3, -7)$

Axis of Symmetry $x = -3$

Opening up

16) $y = 2x^2 + 12x + 18$

Vertex form $y = 2(x+3)^2$

Vertex $(-3, 0)$

Axis of Symmetry $x = -3$

Opening up

17) Write an equation for the parabola with the given vertex that passes through the given point. Vertex: (1, 3) and Point: (-2, -15)

$y = a(x-1)^2 + 3$

$-15 = a(-2-1)^2 + 3$

$-15 = a(9) + 3$

$-15 = 9a + 3$

$-3 \quad -3$

$\frac{-18}{a} = \frac{9a}{9}$

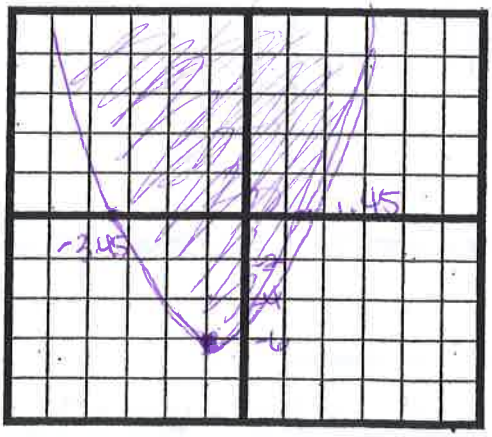
$a = -2$

$y = -2(x-1)^2 + 3$

Graph and solve each inequality.

18) $y > x^2 + 2x - 5$

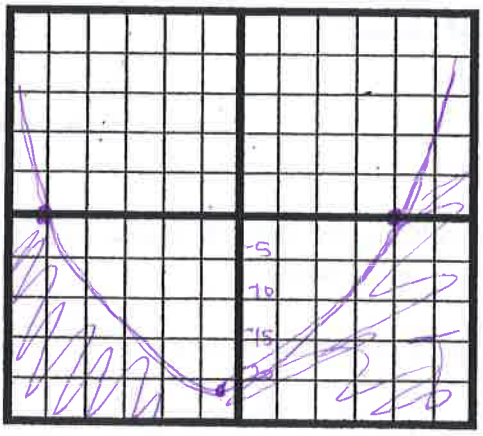
$-3.45 < x < 1.45$



19) $x^2 + x - 20 > 0$

$y < x^2 + x - 20$

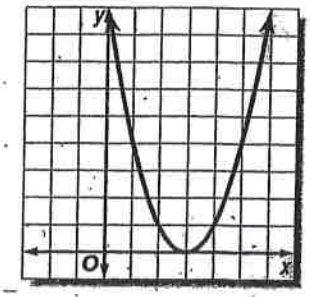
$x < -5$ or $x > 4$



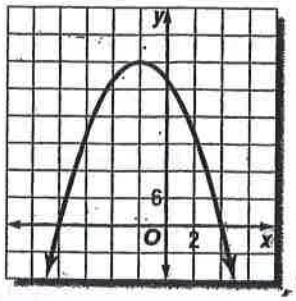
min $(-.5, -20\frac{1}{4})$

Find the solutions to the following graphs.

20) 3



21) -8 and 4



Write an equation for the parabola with the given vertex that passes through the given point.

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A. vertex: (4, −36) point: (0, −20)

$y = (x-4)^2 - 36$

B. vertex: (3, −1) point: (2, 0)

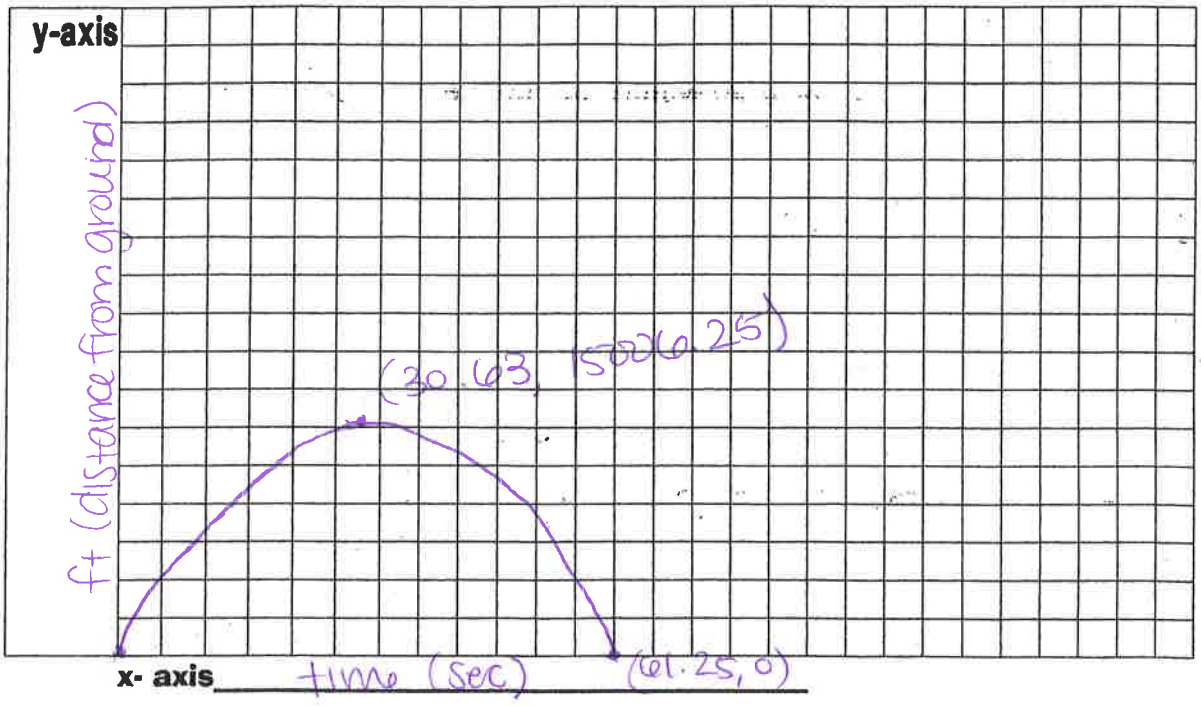
$y = (x-3)^2 - 1$

C. vertex: (−2, 2) point: (−1, 3)

$y = (x+2)^2 + 2$

23. Police are investigating the shooting of a police helicopter. They found a weapon at the scene of the crime that has a suspect's fingerprints on it. Forensic experts have deduced that the weapon is capable of firing with an initial velocity of 980 ft per second, so the height of the bullet in t seconds after firing is found by the function $h(t) = -16t^2 + 980t$

A. Draw a graph that represents this situation. Make sure to label the x and y axis by what they represent.



B. What is the maximum height that the bullet reaches?

15006.25 ft

C. How long did it take the bullet to reach the maximum height?

30.63 sec

D. Once being fired into the air, how long would it take the bullet to reach the ground, assuming the bullet did not hit anything?

61.25 sec

E. If the helicopter was flying at an altitude of 7000 ft at the time it was shot, is it possible that this weapon shot the helicopter? Explain your answer.

yes, max height is 15006 ft.