Key

Algebra 2
Chapter 5 Practice Test

1. Graph and analyze the graph.

$y = -(x-3)^2 + 4$

a. Find the *y*-intercept, the vertex, axis of symmetry, state the maximum or minimum value (circle whether it is max or min), roots, and state the domain and range.

b. Using the same coordinate plane graph:

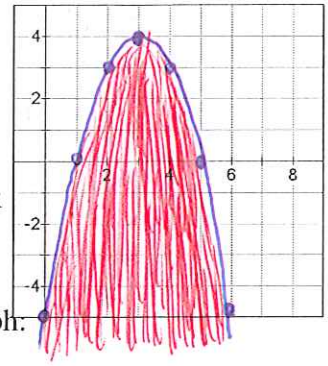
$y \le -(x-3)^2 + 4$

y-int occurs when $x = 0$

$y = -(0-3)^2 + 4$

$y = -9 + 4$

$y = -5$



1.

y-intercept: -5

vertex: $(3, 4)$

axis of sym: $x = 3$

Max or Min: 4

Roots: $x = 1; 5$

Domain: All $\mathbb{R}$

Range: $y \le 4$

(See Graph)

2. Write the following in vertex form.

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

AofS: $x = \frac{-2}{2(1)} = -1$

$(-1)^2 + 2(-1) - 3$

$1 - 2 - 3 = -4$

vertex: $(-1, -4)$

2. $y = (x+1)^2 - 4$

Solve by factoring.
Show work in area provided.

3. $x^2 - 4x - 60 = 0$

$(x-10)(x+6) = 0$

$x - 10 = 0 \quad x + 6 = 0$

$x = 10 \quad x = -6$

3. $x = 10; -6$

(see work)

4. $3x^2 + 5x = 2$

$3x^2 + 5x - 2 = 0$

$(3x-1)(x+2) = 0$

$3x - 1 = 0 \quad x + 2 = 0$

$3x = 1 \quad x = -2$

$x = \frac{1}{3}$

4. $x = \frac{1}{3}; -2$

(see work)

Solve using the quadratic formula.
Fill in the quadratic formula with the appropriate numbers and then give the <u>exact</u> (no decimals) solution only.

5. $4x^2 + 2x - 3 = 0$

$\frac{-2 \pm \sqrt{4 + 48}}{8}$

$\frac{-2 \pm \sqrt{52}}{8}$

13
2|26
2|52

$\frac{-2 \pm 2\sqrt{13}}{8}$

$\frac{-1 \pm \sqrt{13}}{4}$

5. $x = \frac{-1 \pm \sqrt{13}}{4}$

$\frac{-(2) \pm \sqrt{(2)^2 - 4(4)(-3)}}{2(4)}$

6. $-2x^2 + 3x = -5$

$-2x^2 + 3x + 5 = 0$

$\frac{-3 \pm \sqrt{9 + 40}}{-4}$

$\frac{-3 \pm \sqrt{49}}{-4}$

$\frac{-3 \pm 7}{-4}$

$\frac{-3+7}{-4}$ or $\frac{-3-7}{-4}$

$\frac{4}{-4} = -1$ $\quad \frac{-10}{-4} = \frac{5}{2}$

6. $x = -1; \frac{5}{2}$

$\frac{-(3) \pm \sqrt{(3)^2 - 4(-2)(5)}}{2(-2)}$

7. Use your graphing calculator to solve $0 = x^2 - 3x + 4$.
Round to two decimal places.

7. No Solution

Solve the inequalities.

8. $x^2 - 3x - 4 \geq 0$

$(x-4)(x+1) \geq 0$

$x-4 \geq 0 \quad x+1 \geq 0$

$x \geq 4 \quad x \geq -1$

TV: $-3 \quad -1 \quad 0 \quad 4 \quad 6$

8. $x \leq -1$ or $x \geq 4$

9. $x^2 + 5x < -6$

$x^2 + 5x + 6 < 0$

$(x+3)(x+2) < 0$

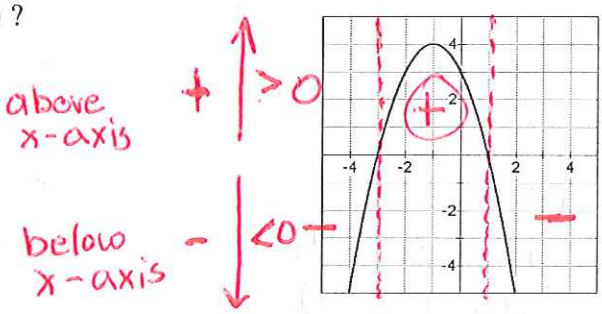
$x+3 < 0 \quad x+2 < 0$

$x < -3 \quad x < -2$

TV: $-5 \quad -3 \quad -2.5 \quad -2 \quad 0$

9. $-3 < x < -2$

10. Solve the following inequality using the given graph of $f(x)$.
When is $f(x) \geq 0$?



$\rightarrow = 0$ on x-axis

10. $-3 \leq x \leq 1$

11. Find the quadratic if the roots are 5 and -7.
sum = -2 prod = -35

11. $x^2 + 2x - 35 = 0$

12. Find the quadratic if the roots are $1 \pm \sqrt{5}$
sum = 2 prod = -4

$\frac{1+\sqrt{5}}{+\ 1-\sqrt{5}}$ $\quad (1+\sqrt{5})(1-\sqrt{5})$

$\frac{2}{} \quad 1 - 5 = -4$

12. $x^2 - 2x - 4 = 0$

13. Find the value of the discriminant, give the quantity of roots, and describe the nature of the roots for $4x^2 - 2x + 5 = 0$

$D = (-2)^2 - 4(4)(5)$

$D = 4 - 80 = -76$

13. D = -76

Quantity: 2

Discription:
Non real roots
or complex roots

14. Find the equation of a quadratic, in vertex form, with a vetex (-3,1) and a passes through the point (0,2).

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

$2 = a(0+3)^2 + 1$

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

$2 = 9a + 1$

$1 = 9a$

$\frac{1}{9} = a$

14. $y = \frac{1}{9}(x+3)^2 + 1$