**Meramec College Algebra TEST 2 Summer 2009**

NAME: _____Score_____/100
Please print

**SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION**

**2 pts. each for 1 – 25. 10 points for #39. 5 pts. each for all others.**

**If you intend to use a formula, state the formula and then use it. No decimals or mixed numbers!!**

**Circle T or F, whichever is correct.**

1. T F $|3x - 7| < 8$ is equivalent to $3x - 7 < 8$.

2. T F A zero of a function is a range element.

3. T F Every zero of a function is an x-intercept of the graph of the function.

4. T F The y-intercept of the graph of a function f is f(0).

5. T F If both sides of the equation $x = \sqrt{-5x - 6}$ are squared to obtain the equation $x^2 = -5x - 6$, the two equations are equivalent.

6. T F The graph of $|4x + 7| < 9$ is an interval on the number line.

7. T F The slope of a vertical line is 0.

8. T F The slope of a horizontal line is 0.

9. T F If the discriminant of a quadratic function is 0, the graph of the function has one x-intercept.

10. T F The graph of a quadratic equation in two variables is a parabola which opens up if $a > 0$ and opens down if $a < 0$.

**Fill in each of the blanks to make the statements true.**

11. If the point (4, 9) is on the graph of a function f, then 4 is a _____ element.

12. If the point (4, 9) is on the graph of a function f, then 9 is a _____ element.

13. If the point (4, 9) is on the graph of a function f, then f(4) = _____.

14. A linear function is a function whose rule may be written in the form _____.

15. A quadratic function is a function whose rule may be written in the form _____.

16. The squaring function is a function whose rule is _____.

17. To find the zeros of a function f we must find the real solution of the equation resulting from _____.

18. The y-intercept of the function whose rule is $f(x) = 5x^3 - 4x^2 + 2x + 9$ is _____.

19. The x-intercepts of the function f whose rule is $f(x) = (x + 3)(x + 5)(2x - 5)$ are _____.

20. The discriminant of $y = 2x^2 - 3x + 4$ is _____.

21. The rule for the vertex of the graph of the quadratic function f is $\left(\frac{-b}{2a}, \_\_\_\_\_\right)$

22. The graph of a linear equation in two variables is a _____ _____ _____.

23. The graph of a linear inequality in two variables is a _____ plane.

24. The equation $y = 5x + 7$ is the boundary equation for the two inequalities _____ and _____.

25. The inequality $|2x + 7| < 3$ is equivalent to the following compound inequality _____.

26. Solve the inequality $|2x + 7| < 3$. Write the solution set in interval notation.

27. Suppose f and g are functions whose rules are $f(x) = 3x + 2$ and $g(x) = \frac{2x}{x+5}$. Find the rule for $f \circ g$.

$f \circ g(x) =$

28. Suppose the rule for a function f is $f(x) = \frac{2x-1}{3x^2}$.

Calculate the range element associated with 3. Use proper notation. No decimals or mixed numbers.

29. What is the domain of the function whose rule is $f(x) = \frac{3x-2}{x+5}$?

30. Show that the point $\left(2,\ \frac{4}{7}\right)$ is on the graph of the function whose rule is $f(x) = \frac{3x-2}{x+5}$. Use proper notation.

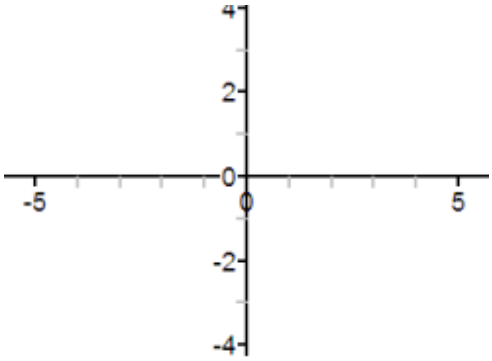


Fig. 2

31. Label the quadrants in Fig. 2.

32. Plot the point (– 3, 2) on Fig. 2.

33. Find the midpoint of the line segment joining (6, –2) and (–1, 3).
No decimals or mixed numbers.

34. Find the length of the line segment joining (6, –2) and (–1, 3). No decimals or mixed numbers.

35. Find the slope of the line segment joining (6, –2) and (–1, 3). No decimals or mixed numbers.

36. Find the equation of the line through (6, –2) and (–1, 3). No decimals or mixed numbers.

37. The graph of absolute value inequality $|ax + b| < c$ is shown in Fig. 1.

(a) (2 pts.) Use the roster method to write the solution set for the equation $|ax + b| = c$.

(b) (3 pts.) On Fig. 1, shade the solution set for $|ax + b| > c$.

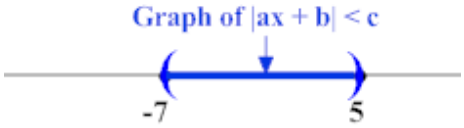
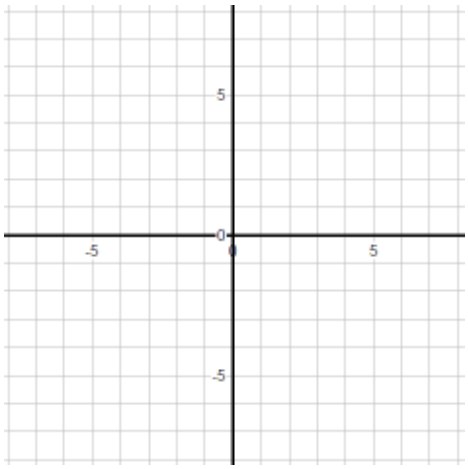



Fig. 1

38. Consider the following facts about a function named f.

a) f is a quadratic function.
b) The leading coefficient is negative.
c) f(0) = 3
d) f has two zeros – 3 and 1
e) The vertex is (–1,4)

Sketch the graph of f. Label all important points.




**39.** (6 pts) A _____ consists of three things;

- A set called the _____
- A set called the _____
- A _____ which associates _____ element of the _____ with a _____ element of the range.

(4 pts)