

August, 2009

Welcome to a new year at Robert E. Lee!

You are enrolled in an advanced mathematics class which, beginning this year, has a summer homework assignment. Enclosed is a set of problems for you to work through and bring with you the first day of class. These problems cover the topics in which you are expected to be proficient.

On the first day of class you will have an opportunity to ask questions and correct your work. The problems will be due the following class. You will also have a quiz over the material that day.

This assignment is intended to refresh your memory and jumpstart the new year. We know that you may not remember everything but the problems should give you an idea of what you are expected to bring to the class. We want to be able to start the new coursework as soon as possible and minimize review time.

The Math Faculty at Lee is very pleased that you have chosen to pursue higher mathematics and we want to provide the best learning environment possible. We hope this project will help promote a quality mathematical experience in the coming year.

Enjoy the rest of your summer vacation and we look forward to meeting you soon.

PAP /PIB /AP Mathematics Faculty of Robert E. Lee High School

The following is a list of terms and definitions that you should know. Match the term on the right with the definition on the left by placing the letter in the blank. None will be used more than once.

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| 1. _____ Two points and all the points between them that lie on the line containing the two points. | A. scalene triangle |
| 2. _____ Part of a line with an endpoint that extends endlessly in one direction. | B. perpendicular lines |
| 3. _____ Two noncollinear rays with a common endpoint. | C. line segment |
| 4. _____ The common endpoint of two rays that form an angle. | D. obtuse angle |
| 5. _____ A segment from the center of a circle to any point on the circle. | E. quadrilateral |
| 6. _____ An angle whose measure is 90° . | F. acute angle |
| 7. _____ The point that divides a segment into two congruent segments. | G. parallel lines |
| 8. _____ Lines that intersect to form right angles. | H. octagon |
| 9. _____ An angle whose measure is between 0° and 90° . | I. obtuse triangle |
| 10. _____ A ray that divides an angle into two congruent angles. | J. vertex |
| 11. _____ A chord that is drawn through the center of a circle. | K. pentagon |
| 12. _____ An angle whose measure is between 90° and 180° . | L. right angle |
| 13. _____ Lines in the same plane that never intersect. | M. ray |
| 14. _____ A pair of angles whose sum is 90° . | N. decagon |
| 15. _____ A polygon with exactly four sides. | O. angle bisector |
| 16. _____ A triangle in which all three angles measure less than 90° . | P. regular polygon |
| 17. _____ A polygon with exactly ten sides. | Q. right triangle |
| 18. _____ A triangle with no congruent sides. | R. midpoint of a segment |
| 19. _____ A polygon with exactly eight sides. | S. isosceles triangle |
| 20. _____ A triangle in which one angle measures greater than 90° . | T. supplementary angles |
| 21. _____ A polygon with exactly five sides. | U. radius of a circle |
| 22. _____ A pair of angles whose sum is 180° . | V. acute triangle |
| 23. _____ A triangle that contains an angle whose measure is equal to 90° . | W. diameter of a circle |
| 24. _____ A polygon with exactly six sides. | X. complementary angles |
| 25. _____ A triangle with at least two congruent sides. | Y. hexagon |
| 26. _____ A polygon in which all sides are congruent and all angles are congruent. | Z. angle |

General instructions: All work must be neat and readable to receive credit.

All answers must be exact. ie : $\frac{15}{7}$, 12π , $3\sqrt{5}$.

All graphing must be done on graph paper using a straight edge.

Graphs must be labeled with the appropriate problem number.

Formulas can be found at www.tea.state.tx.us.

When writing the equation of a line, you may use slope-intercept form or point slope form, but all answers should be given in standard form ($Ax + By + C = 0$).

Complete each of the following problems on graph paper. Show all work neatly, next to the graph.

1. Plot points A (-12, 5) and B (-2, 1) and draw \overleftrightarrow{AB} .

a) Use the formula to find the slope of \overleftrightarrow{AB} .

b) Use the formula to find the length of \overline{AB} .

c) Use the formula to find the coordinates of the midpoint of \overline{AB} .

d) Write the equation of \overleftrightarrow{AB} in slope-intercept form.

e) Write the equation of the line that contains the perpendicular bisector of \overline{AB} .

For problems 2 and 3, graph each set of lines on a separate coordinate graph and answer the following questions for each.

a) Identify any parallel or perpendicular lines in each problem.

b) Accurately describe the figure formed by the intersecting lines.

c) Find the area of the figure formed by the intersecting lines.

d) Find the perimeter of the figure formed by the intersecting lines.

2. $y = \frac{1}{4}x + 4$

$$y = \frac{-1}{3}x + 12$$

$$y = 3x + 2$$

3. $x = -3$

$$x = 2$$

$$y = 3$$

$$y = \frac{1}{2}x$$

Solve each of the following problems in the space provided or on your own paper if you prefer.

4. $5x + 7x = 9x - 40$

5. $\frac{1}{2}x + \frac{2}{3}x = 28$

6. $\frac{5}{2}(3 + x) = 75$

7. $\frac{x}{16} = \frac{4}{x}$

8. $\frac{5x + 6}{10} = \frac{4x - 8}{6}$

9. $\frac{x - 4}{x + 6} = \frac{x - 8}{x - 3}$

Solve each of the following by factoring.

10. $x^2 - 9x + 18 = 0$

11. $x^2 + 12 = 7x$

12. $2x^2 + 5x + 2 = 0$

Solve each system of equations by substitution or elimination. Verify your solution by graphing each set of lines on a separate coordinate graph.

13. $x + y = 12$

14. $2x - 6y = 22$

15. $x = 9y - 27$

16. $\frac{y - 5}{x - 3} = 9$

$x - y = 4$

$4x + 6y = 8$

$5x - 11y = 1$

$\frac{y - 9}{x - 1} = \frac{5}{3}$

Use graph paper to draw a diagram for each of the following. Show your work on the graph paper next to the graph.

17. Write the equation of the line that contains the point (4, 2) and is perpendicular to the line $y = -2x - 4$.
18. If the x and y-intercepts of a line are (4, 0) and (0, -3), write the equation of the line.
19. What is the area of a triangle formed by the x-axis, the y-axis and the line $y = x - 5$.
20. Write the equation of each of the lines that contain the diagonals of rectangle ABCD with vertices that have coordinates A(6, -1), B(6, 2), C(3, 2), and D(3, -1).
21. The coordinates of the endpoints of the diameter of a circle are (2, 1) and (10, 7). Find each of the following :
 - a) the length of the diameter
 - b) the length of the radius
 - c) the coordinates of the center of the circle
 - d) the exact area of the circle
 - e) the exact circumference of the circle
 - f) the equation of the line that contains the diameter.
22. Suppose a gallon of gasoline costs \$2.50.
 - a) Write an equation that represents the relationship between cost (y) and gallons (x).
 - b) Find the slope of the graph of the line.
 - c) Does the line contain the origin ?
23. Suppose the cost in dollars of a taxi ride is represented by the equation $C = 0.42d + 3.50$, where C is the cost of the taxi and d is the number of tenths of miles traveled.
 - a) Name the dependent variable and state the range of the function.
 - b) Name the independent variable and state the domain of the function.
 - c) What is the slope of the line ?
 - d) What is the cost if the taxi travels 5 miles ?
 - e) What is the cost if the taxi travels 120 miles ?