

Name: _____

Math 138 – Exam 1

Directions: Read each problem carefully. Remember to show all work in a logical and legible manner. To receive credit, **all answers must follow logically from the work that you show on your exam.** You may not share calculators or use the calculator function of a cell phone.

1. Students are traveling in two cars to a LSU football game 135 miles away. The first car leaves on time and travels at an average speed of 45 miles per hour. The second car starts $\frac{1}{2}$ hour later and travels at an average speed of 55 miles per hour. At these speeds, how long will it take the second car of students to catch up to the first car?

2. Consider the equation $y=x^2-2x-3$

a. Find the x-intercepts.

b. Find the y-intercepts.

3. Find the slope and y-intercept of $2x+3y=6$.

Slope: _____

y-intercept: _____

7. Find the equation of the line parallel to $x=4$ and passing through $(1,3)$.
8. On a yardstick you notice that 13 inches is the same length as 33 centimeters.
- Use this information to find a mathematical model that relates centimeters to inches.
 - Use the model to find the number of centimeters equivalent to a length of 30 inches.

9. Solve the following system of equations by substitution:

$$\begin{cases} x + y = 4 \\ x^2 - y = 2 \end{cases}$$

10. Solve the following system of equations by elimination:

$$\begin{cases} 5x + 6y = 24 \\ 3x + 5y = 18 \end{cases}$$

11. You invest \$5000 in equipment to make LSU 2008 National Champion t-shirts. The shirts can be produced for \$5.25 per shirt and each will be sold for \$20 per shirt. Approximately how many shirts must you sell to break even?

12. A total of \$32,000 is invested in two municipal bonds that pay 5.75% and 6.25% simple interest. The total annual interest is \$1930. How much is invested in each bond? Write your answers in the blanks below.

_____ invested in bond paying 5.75%

_____ invested in bond paying 6.25%

Bonus: Find the equation of the circle whose endpoints of the diameter occur at the solutions of

$$\begin{cases} x - y = -3 \\ x^2 - y = 1 \end{cases}$$