MATH 95 – Intermediate Algebra Practice Exam #1

NOTE: Show your work and circle or highlight your final answer.

1. What is the equation of the line in slope-intercept form containing:
   a. a \( y \)-intercept of \(-3\) with a slope of \(6\)   b. \((3, -5)\) with slope \(2\)
   c. \((-2, -7)\) and \((3, 8)\)   d. \(y\)-intercept at \(6\) and perpendicular to \(y = \frac{3}{4}x - 4\)
   e. \(y\)-intercept at \(-3\) and parallel to \(y = \frac{5}{4}x - 4\)

2. Find the slope of the line through the two points:
   a. \((-3, 3)\) and \((6, -3)\)   b. \((2, 4)\) and \((4, -2)\)

3. Find the slope of the line, \(y\)-intercept, and sketch the graph:
   a. \(5x - 3y = 15\)   b. \(3x + 2y = 12\)
   \[\begin{align*}
   m &= \ldots \\
   b &= \ldots
   \end{align*}\]
4. Find the $x$- and $y$-intercepts for the following lines:
   
   a. $5x - 3y = 15$
   
   x-int.: 
   
   b. $3x + 2y = 12$
   
   y-int.: 

   Use the above information to sketch the graph. Remember to find a third point for each.

   c. 

   d. 

5. Graph the following:

   a. $3y + 6 = 0$

   b. $2x = -4$

6. Graph the following:

   a. $x + y < 0$

   b. $x \geq -2$
7. Find the domain of the following functions.
   a. \( f(x) = \frac{9}{x-1} \)
   b. \( p(x) = 2x^2 + 5 \)
   c. \( f(x) = \frac{2}{x^2 - x - 6} \)

8. State whether the following relations are functions:
   a. \{(-1, 1), (3, 1), (4, 8)\}
   b. \{(2, 5), (-4, -3), (2, -4)\}

9. State the domain and range of the following relations:
   a. \{(4, 3), (-2, 3), (5, 4)\}
   b. \{(-1, 4), (2, -4), (-1, -4)\}

10. State the domain and range of the following relations:
11. Determine which of the above relations (from #10) are functions.

12. Solve by graphing:
   a. \( y = 2x - 4 \)
   \( 2x - y = -4 \)
   
   b. \( x + y = -1 \)
   \( 3x - y = 9 \)

13. Solve by substitution:
   a. \( 3x + 4y = -19 \)
   \( y = -x - 5 \)
   
   b. \( x - 2y = 0 \)
   \( 4x - y = -7 \)
14. Solve by elimination:
   \[-4x + 5y = 18\]
   \[x + 5y = 8\]

15. Solve using any method:
   \[3x - 2y = 21\]
   \[x = 14 + 3y\]

16. The sum of two numbers is seventy. Their difference is eighty. Find the numbers.

17. Tickets to a local movie were sold at $5.00 for adults and $3.50 for students. If 540 tickets were sold for a total of $2220, how many of each type of ticket were sold?

18. A solution of 49% alcohol is to be mixed with a solution of 25% alcohol to form 96 liters of a 40% solution. How many liters of each solution must be used?