EXAM 2 - MATH 102

DATE: Tuesday, February 20

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 5 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. (a) Solve the absolute value inequality $|4x + 2| - 4 \geq 2$, graph the solution set and write your answer in interval notation. (3 points)
   (b) Find the domain of the function $f(x) = \sqrt{30 - 5x}$. (2 points)
2. (a) Find the equation of the line that passes through the points $A = (-3, 1)$ and $B = (2, -3)$. (3 points)
   (b) Find the equation of the line that is perpendicular to the line $\overline{AB}$ and passes through the point $C = (1, -2)$. (2 points)
3. (a) Find the x- and the y-intercepts of the line $3x + 5y = 15$. (2 points)
   (b) Graph the line $3x + 5y = 15$. (1 point)
   (c) In a **different figure**, graph the solution set of the linear inequality $3x + 5y \geq 15$. (2 points)
4. Use elimination to solve the system

$$\left\{\begin{array}{rcrcrcr} x & - & 2y & + & 3z & = & -10 \\ -x & + & y & - & 4z & = & 17 \\ 3x & - & y & - & 2z & = & 15 \end{array}\right\}$$

5. A woman has \$5.95 in nickels and dimes. If she has a total of 75 coins, how many nickels and how many dimes does she have?
   (a) Set and describe your variables carefully. (1 point)
   (b) Write two equations using your variables that mathematically reflect the data in the problem. (2 points)
   (c) Solve the system of equations to answer the problem. (2 points)
6. It takes a motor boat $1\frac{1}{3}$ hr to go 20 miles downstream and $2\frac{2}{9}$ hr to return. Find the speed of the current and the speed at which the boat can travel in still water.
   (a) Set your variables. (1 point)
   (b) Write down equations that reflect the data of the problem. (2 points)
   (c) Solve the equations to answer the question posed in the problem. (2 points)