Sample Questions for Exam # 1

1. Solve the following system of equations by the addition method. *(Section 3.5)*

   \[
   \begin{align*}
   2x + 3y &= 8 \\
   3x + 4y &= 2
   \end{align*}
   \]

2. Solve the following system of equations by the addition method. *(Section 3.5)*

   \[
   \begin{align*}
   -2x + 8y &= 10 \\
   10x - 40y &= 2
   \end{align*}
   \]

3. Use the point-slope formula to find the equation of a line that goes through the points (1, 1.3) and (2.5, 4). Do not simplify the equation. *(Section 7.3)*
4 Solve the equation $|2x + 2| = 5$, and check your answers. (Sections 4.4 and 7.2)

5 Solve the equation $|\frac{3}{2}x + 4| = 6$, and check your answers. (Sections 4.4 and 7.2)

6 Let $f(x)$ be the function $f(x) = x^2 - 2x + 3$. Find $f(-2)$. (Section 7.1)

$$f(-2) = \underline{\hphantom{0}}$$
7 Use the graph of \( f(x) = x^2 - 2x - 8 \) given below to answer the following questions. \( (Section \, 7.3) \)

(a) What are the coordinates of the vertex?

(b) What is the \( y \)-intercept?

(c) What are the \( x \)-intercepts?

(d) What is the domain of \( f \)?

(e) What is the range of \( f \)?

(f) On what interval is \( f \) increasing?

(g) On what interval is \( f \) decreasing?

8 Graph the solution set of the inequality \(|x + 3| > 4\) on a number line. \( (Section \, 4.4) \)

9 Graph the solution set of the inequality \(|2x + 1| \leq 3\) on a number line. \( (Section \, 4.4) \)
10. Solve \(4x^2 - 4x + 1 = 7\) by factoring the left side. Show all work. (Section 7.4)

11. Solve the equation \(x^2 - 8x = 3\) by completing the square. (Section 7.5)
12 An isosceles triangle has two sides that are the same length and one side of a different length. The base of the isosceles triangle shown in the figure below is 2 inches shorter than each of the other sides. The perimeter of the triangle is 29 inches. Find the lengths of each side. (Section 3.6)

![Diagram of an isosceles triangle with sides labeled x, x, and y.]

13 A certain mutual fund provides an annual return of 9% interest, and an internet savings account provides an annual return of 4% interest. An investor has $5000 to invest. How much should she put into each investment if she wants to get exactly $400 in interest in one year? Give your answers in dollars and cents. (Section 3.6)
The following table lists values of $x$ and $y$. Use a quadratic regression to predict the value of $y$ when $x = 50$. (Section 7.4)

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>60.4</td>
</tr>
<tr>
<td>38</td>
<td>75.6</td>
</tr>
<tr>
<td>45</td>
<td>84.1</td>
</tr>
<tr>
<td>55</td>
<td>98.9</td>
</tr>
</tbody>
</table>

Use your calculator to graph the function $f(x) = -2x^2 - 5$ on a window with $Xmin = -3$ and $Xmax = 3$. Copy the graph here. Then use it to answer the following question: What is the range of $f$?

Range: ___________