1. Solve the following quadratic equations using the method of your choice.

   a) \(-7(3x + 8)^2 + 4 = -1\)

   b) \(36x = 24x^2 - 4x^3\)

   c) What are the \(x\)-intercepts of the parabola described by the quadratic function 
      \(f(x) = 4x^3 - 12x^2 - 9x + 27?\)

2. Solve the following quadratic equation by the method of completing the square or the quadratic formula.

   \(2x^2 - 3x - 10 = 0\)

3. [Calculator Problem] The percentage of U.S. firms that perform drug tests on employees for various years is shown in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>22</td>
</tr>
<tr>
<td>1990</td>
<td>51</td>
</tr>
<tr>
<td>1992</td>
<td>72</td>
</tr>
<tr>
<td>1995</td>
<td>78</td>
</tr>
<tr>
<td>1998</td>
<td>74</td>
</tr>
<tr>
<td>2000</td>
<td>66</td>
</tr>
<tr>
<td>2002</td>
<td>62</td>
</tr>
</tbody>
</table>

   Let \(P(t)\) represent the percentage of firms that perform drug tests on employees \(t\) years since 1985. A model for this situation is given by the following quadratic function:

   \[ P(t) = -0.638t^2 + 14.5t - 3.40 \]

   The problems below can be solved using your graphing calculator in a variety of ways. Be sure you do not just give an answer, but instead explain or describe the steps you used on your calculator to find your answer. And don’t forget to answer each question with one or two complete sentences.
a) According to the model what percent of firms were testing for drugs in 2005?

b) Solve $P(t) = 10$. What does this mean in terms of the situation?

c) According to the model (not the table), in what year was the percent of firms testing for drugs the highest?

d) According to the model (not the table), what was the highest percent of firms testing for drugs?

4. Consider the rational expression.

$$\frac{x^2 + x - 20}{-x^2 + 11x - 28}$$

a) Find the domain of the expression.

b) Simplify the rational expression.

c) Find the domain of the simplified expression in part b) above.

5. Perform the indicated operation and simplify your answer, if possible:

$$\frac{x - 2}{x^2 - x - 2} - \frac{4}{x^2 - 1}$$

6. Perform the indicated operation, and simplify your answer, if possible:

$$\frac{4x^3 - 8x^2 - x + 2}{2x^2 - 11x + 5} \div (2x^2 - 3x - 2)$$

7. Consider the function $f(x) = \frac{2}{x - 1} + \frac{4}{x - 2}$. Solve the equation $f(x) = -1$.

8. For a 5-year high school reunion, graduates rent out a restaurant that charges a flat fee of $500 for a jazz trio, plus $50 per person for food and drinks.

a) Suppose $n$ people (including all the graduates and the three musicians who also get food and drinks) are in the restaurant. Let $T(n)$ represent the total cost (in dollars) of the reunion. Write an equation for $T(n)$.

$$T(n) =$$
b) Only the graduates are paying for the expenses; the musicians are not paying. Write an expression for the number of people who are paying for the expenses. Use \( n \) as your variable.

\[
P(n) = \frac{T(n)}{n}
\]

\( T(n) \) represents the total expenses.

c) The expenses will be divided evenly among the graduates. Let \( P(n) \) be the portion of the total expenses paid by each graduate. Write an equation for \( P(n) \), using your expression for \( T(n) \) and your expression from part b).

Suppose the cost to each graduate was $60. How many graduates came to the reunion?

9. Los Angeles is about 500 miles due south of Reno, Nevada. L.A. is also almost due west of Albuquerque, New Mexico.

a) Draw and label a illustrating the given information.

b) If the distance from Reno to Albuquerque is about 1000 miles, how far is it from L.A. to Albuquerque?

10. Consider the circle drawn below
a) Identify the center of the circle. What are the coordinates of the center point?

b) Identify one point ON the circle. What are the coordinates of the point on the circle you selected?

c) Calculate the radius of the circle.

d) Write down the equation of the circle.