Homework #2 Part A

1. Find the equation of the line through the points \((-1, 3)\) and \((2, 4)\).

2. Find the equation of the line with slope \(1/2\) and which goes through the point \((5, -4)\).

3. Find the equation of the line which is parallel to the line with equation \(y = 2x + 279\), and which goes through the point \((1, 1)\).

4. Find the equation of the line with \(y\)-intercept 5 and which is perpendicular to the line with equation \(5x - 3y = 4\).

5. Find the equation of the line perpendicular to the line with equation \(2x + y = 3\) and with \(x\)-intercept 4.

6. Multiply the following to obtain a simplified polynomial:
   (a): \((x-3)(x-2)\)  (b): \((x+4)(x-5)\)  (c): \((x+a)(x+b)\).
   (d): \((3x-2)(4x+1)\)  (e): \((2x^2-1)(x+1)\)  (f): \((x-2)(x+3)(x+2)\).

Find the solutions to 7 through 10 by factoring.

7. \(x^2 - 6x + 9 = 0\)

8. \(x^2 - 7x = -12\)

9. \(2x^2 + 5x - 3 = 0\)

10. \(x^4 - 3x^2 + 2 = 0\)
    Hint: Write \(z = x^2\), and rewrite this as a quadratic in \(z\). Solve for \(z\) by factoring, the solve for \(x\) using \(z = x^2\).
Homework #2 Part B

1. Find solutions to the following by completing the square:
   (a): \( x^2 + 4x - 6 = 0 \) \hspace{1cm} (b): \( x^2 - x - 1 = 0 \)

Find the solutions to 2 through 5 using the quadratic formula. Before finding solutions, check to see that it does have solutions by finding the discriminant (that is, \( b^2 - 4ac \)).

2. \( x^2 + x - 4 = 0 \)
3. \( x^2 + 5x + 3 = 0 \)
4. \( x^2 + 3x + 5 = 0 \)
5. \( 2x^2 - 8x + 5 = 0 \)

Solve the following inequalities. Be sure you give a clear description of all values of \( x \) which satisfy the inequality.

6. \( x^2 - 8x + 15 > 0 \)
7. \( x^2 + 3x \leq -2 \)
8. \( (2x + 1)(3x - 2) \geq 0 \)
9. \( 3x^2 + x - 2 < 0 \)
10. \( x^2 - 8x + 16 \leq 0 \)