Math 1031 College Algebra and Probability
Chapter 2 Worksheet

October 5, 2010

1. (a) Graph the equations \( y = |x| \) and \( y = |x + 1| \) by plotting points. Be sure to label both axes and all intercepts.

<table>
<thead>
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<th>x</th>
<th>y</th>
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(b) Do either of the graphs from part (a) have \( x \)-axis symmetry, \( y \)-axis symmetry, or symmetry about the origin? Explain both in terms of your graph and by computing.
(c) Graph the equation \( y = -2|x + 1| \). Label both axes and all intercepts.

\[
\begin{array}{|c|c|}
\hline
x & y \\
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\end{array}
\]

(d) Graph the equation \( y = -2|x + 1| - 3 \).

\[
\begin{array}{|c|c|}
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x & y \\
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\end{array}
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(e) There are two lines that make up the graph in part (d). Find the equation of each of these lines.
2. (a) Graph the line $2x + 3y = 6$ by finding the $x$- and $y$-intercepts. Be sure to label both axes and all intercepts.

(b) Find an equation for the line which is parallel to $2x + 3y = 6$ and which passes through the point $(-1, 2)$.

(c) Find an equation for the line which is perpendicular to $2x + 3y = 6$ and which passes through the point $(-1, 2)$.

(d) Graph the lines from parts (b) and (c) on the same coordinate plane as the line from part (a). Does your graph make sense? How can you tell?
3. (a) Determine the constant you would have to add to $2x^2 + 4x$ in order to make it a perfect square.

$$2y^2 - 4y +$$

(b) Determine the constant you would have to add to $2y^2 + 6y$ in order to make it a perfect square.

$$2x^2 + 6x +$$

(c) Show that the graph of the equation

$$2x^2 + 2y^2 + 6x - 4y - 23/2 = 0$$

is a circle by writing the equation in standard form.

(d) What is the center and radius of the circle from part (c)?

(e) Graph the circle from part (c).

(f) Show that the point $(-3/2, 4)$ lies on the circle. How far is it from $(-3/2, 4)$ to the center of the circle? Confirm your answer using the distance formula.