AA Unit 4

Warm Up 10/20/2014

1. Solve by completing the square: \(x^2 + 12x + 3 = 15\)

Steps:
1. \(ax^2 + bx = c\)
2. \(ax^2 + bx + \left(\frac{b}{2}\right)^2 = c + \left(\frac{b}{2}\right)^2\)
3. \((x + \frac{b}{2})^2 = c + \left(\frac{b}{2}\right)^2\)
4. Square root both sides
5. Solve for \(x\)

2. \(3x^2 - 4x + 5\)
Rewrite in standard form. Find the discriminant. How many roots does the quadratic have?

Discriminant: \(b^2 - 4ac\)

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Notes 10/20: Quadratic Formula + Discriminant

**Quadratic Formula:** $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Discriminant:** $b^2 - 4ac$

Tells us how many solutions our quadratic equation has. It gives us a general idea of what our graph looks like.

<table>
<thead>
<tr>
<th>Value of discr.</th>
<th># of sol</th>
<th>graph</th>
</tr>
</thead>
<tbody>
<tr>
<td>$b^2 - 4ac &gt; 0$</td>
<td>2</td>
<td><img src="image1" alt="Graph" /></td>
</tr>
<tr>
<td>$\frac{-b + \sqrt{b^2 - 4ac}}{2a}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{-b - \sqrt{b^2 - 4ac}}{2a}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b^2 - 4ac = 0$</td>
<td>1</td>
<td><img src="image2" alt="Graph" /></td>
</tr>
<tr>
<td>$\frac{-b + \sqrt{0}}{2a}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{-b - 0}{2a}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
\[ b^2 - 4ac < 0 \]
\[ \sqrt{-1} \]
\[ \text{no real solutions} \]

\[ \boxed{\text{Ex}} \]
\[ 2x^2 - 4x + 3 = 0 \]
\[ a = 2, \ b = -4, \ c = 3 \]
\[ (-4)^2 - 4(2)(3) \]
\[ 16 - 24 \]
\[ -8 \]
\[ \boxed{\text{Ex}} \]
\[ x^2 - 5x = -2 \]
\[ 2x^2 - 5x + 2 = 0 \]
\[ a = 1, \ b = -5, \ c = 2 \]
\[ (-5)^2 - 4(1)(2) \]
\[ 25 - 8 \]
\[ 17 \]

\[ \text{2 sol} \]
\[ x \text{-int} \]