

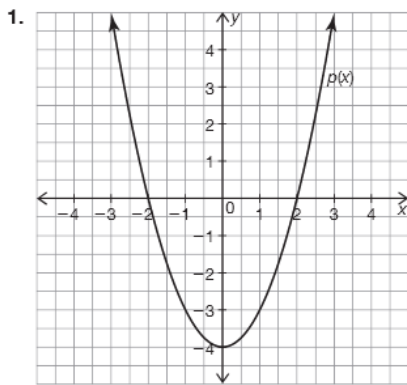
**LESSON 5.1** Skills Practice

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**Unequal Equals**  
**Solving Polynomial Inequalities**

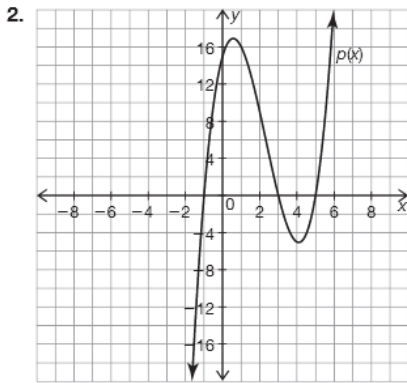
**Problem Set**

Analyze the graph. Identify the set of  $x$ -values to represent when  $p(x) < 0$  and when  $p(x) > 0$ .



The function  $p(x) < 0$  when  $\{-2 < x < 2\}$ .

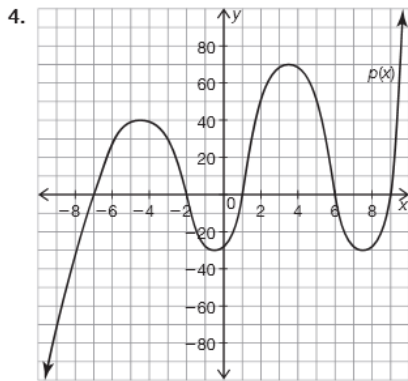
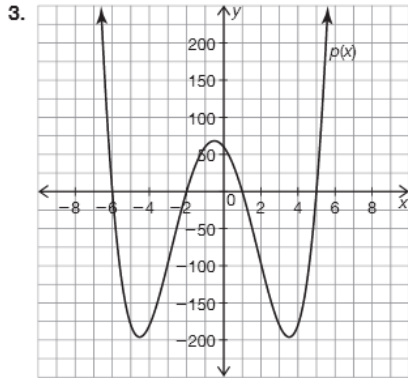
The function  $p(x) > 0$  when  $\left\{ \begin{matrix} x < -2 \\ x > 2 \end{matrix} \right\}$ .



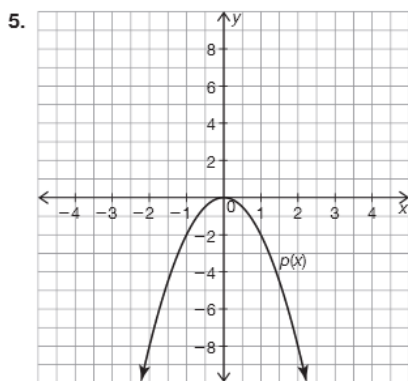
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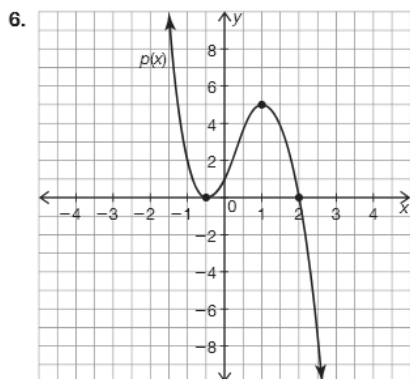


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Use a graphing calculator to solve each inequality. Round decimals to the nearest hundredths.

7.  $21 < 3x^2 + 1$

I graphed  $y_1 = 3x^2 + 1$  and  $y_2 = 21$ .

Using the intersection function of the calculator, I determined that  $21 < 3x^2 + 1$  when  $x < -2.58$  or  $x > 2.58$ .



8.  $4x^2 - 5 \leq 9$

9.  $-3 \leq x^3 + 2x + 6$

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10.  $-10.5 > -1.5x^2 - 15.5x$

11.  $-1.2x^3 - 4x^2 + 15x \leq 1$

12.  $-6.6 < -12.4x^2 + 2.2x^3 + 0.8x^4$

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Solve each inequality by factoring and sketching. Use the coordinate plane to sketch the general graph of the polynomial in order to determine which values satisfy the inequality.

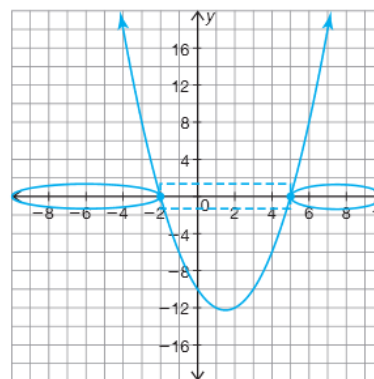
13.  $x^2 - 3x - 10 < 0$

$(x - 5)(x + 2) = 0$

$x = 5, -2$

The boxes represent the  $x$ -values where the polynomial is less than zero. The ovals represent the  $x$ -values where the polynomial is greater than zero.

The function  $x^2 - 3x - 10 < 0$  when  $-2 < x < 5$ .



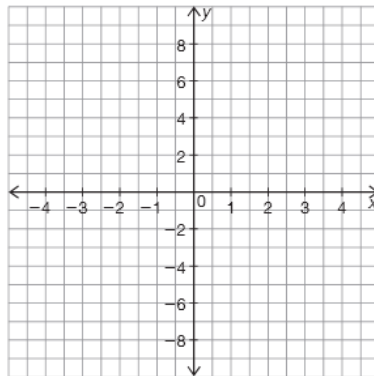
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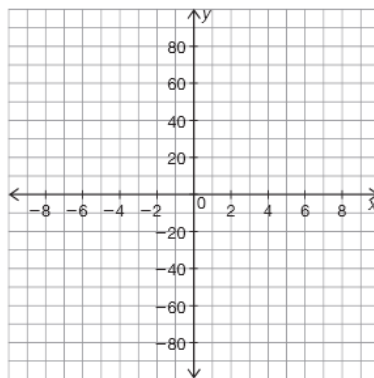
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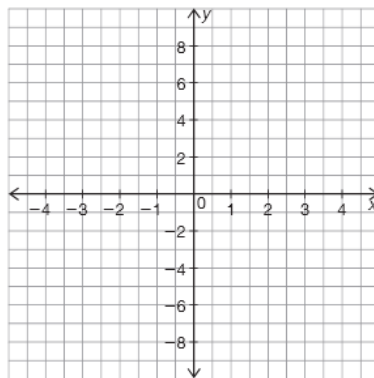
14.  $x^3 + 3x^2 + x + 3 \geq 0$



15.  $2x^3 + 6x^2 - 20x \leq 0$



16.  $x^3 + 4x^2 + x - 6 > 0$

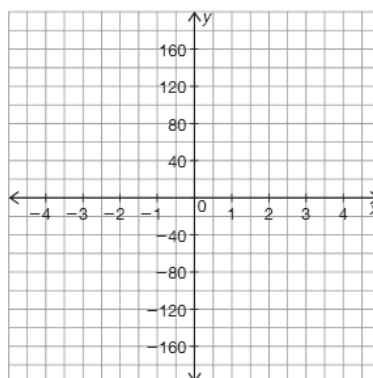


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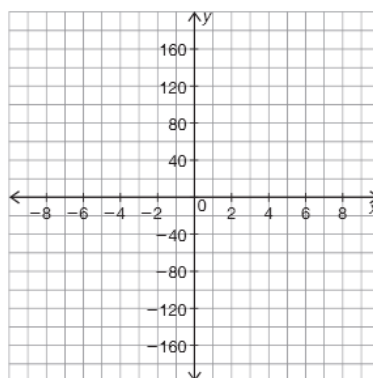
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17.  $x^4 - 25x^2 + 144 \geq 0$



18.  $x^4 - 8x^3 + 2x^2 + 80x - 75 \leq 0$



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