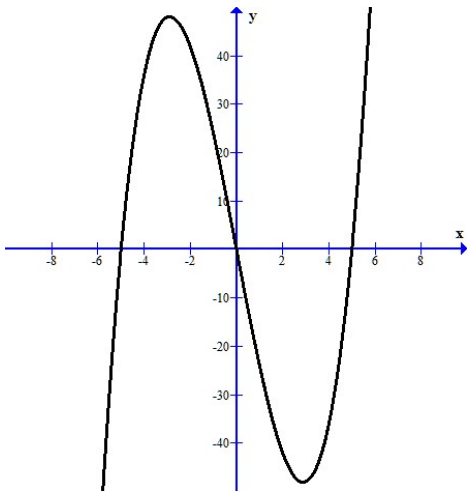
5.6 Polynomial and Rational Inequalities

▼ Solving Polynomial Inequalities Graphically

▼ Example 1



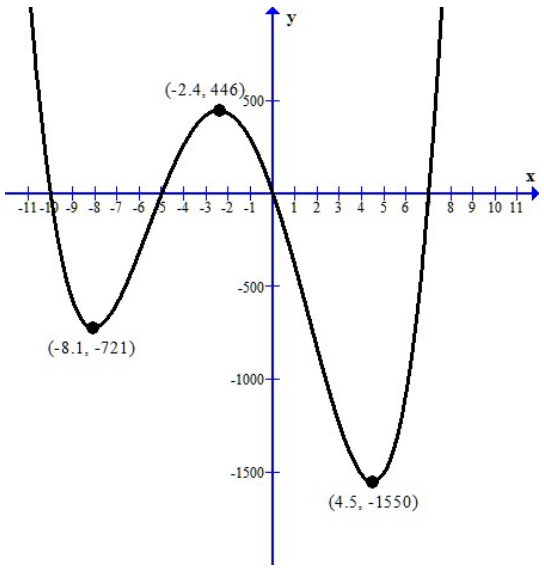
$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Example 2



$f(x) > 0$

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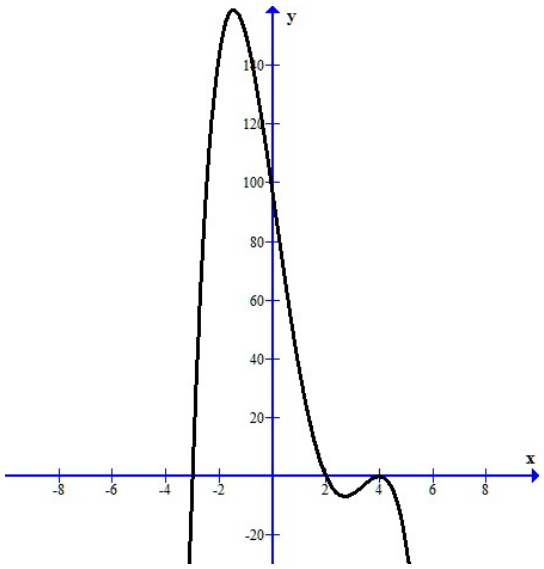
$f(x) < 0$

$f(x) \leq 0$

▼ Example 3



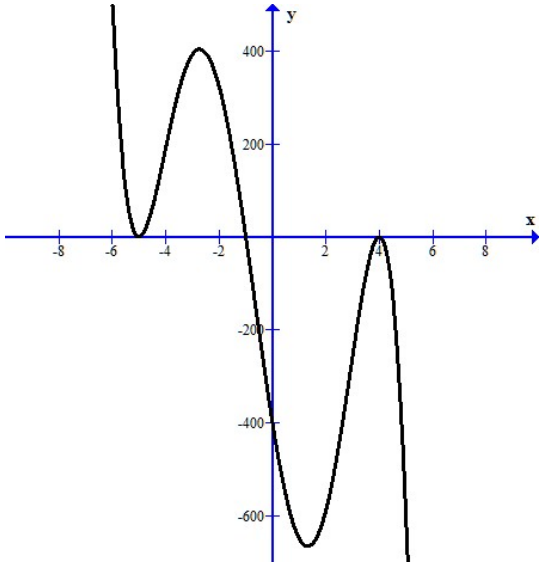
$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Example 4



$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Solving Polynomial Inequalities Algebraically

▼ Example 1: Solve $(x+2)(x-3)^2(x-4) > 0$

▼ Example 2: Solve $x^4 + x^3 - 12x^2 \leq 0$

▼ Example 3: Solve $x^3 + 4x^2 + x \geq 0$

▼ Example 4: Solve $x^3 + 2x^2 > 3x + 6$

▼ Example 5: Given $f(x) = 2x^4 + 19x^3 - 33x^2 - 511x - 245$

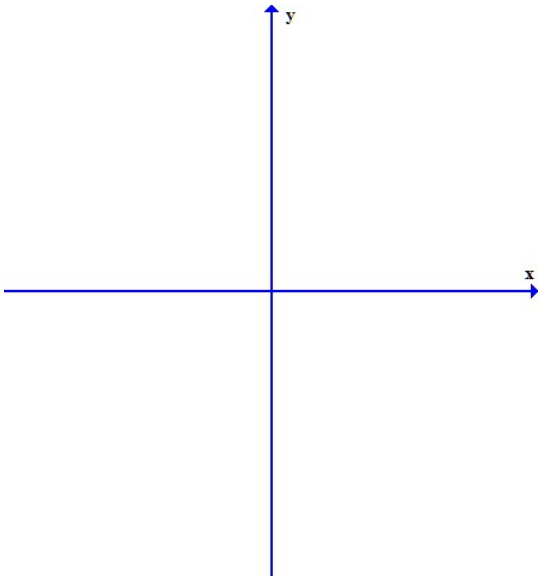
a) Find the zeros of the function.

b) Factor the given function over the real numbers.

c) Graph the given function by hand.

Degree	Leading Coefficient

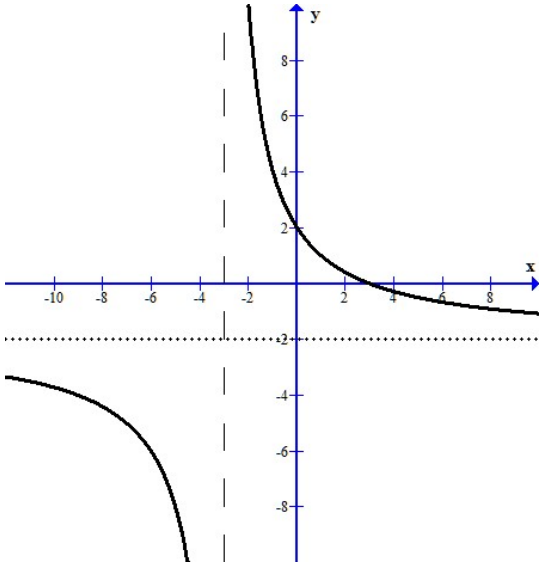
Factor			
Real Zeros			
Multiplicity			
Behavior			



d) Solve $f(x) < 0$, $f(x) \leq 0$, $f(x) > 0$, $f(x) \geq 0$

▼ Solving Rational Inequalities Graphically

▼ Example 1



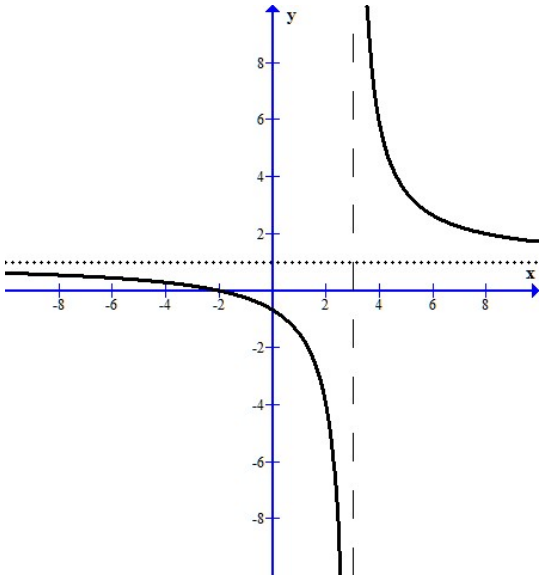
$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Example 2



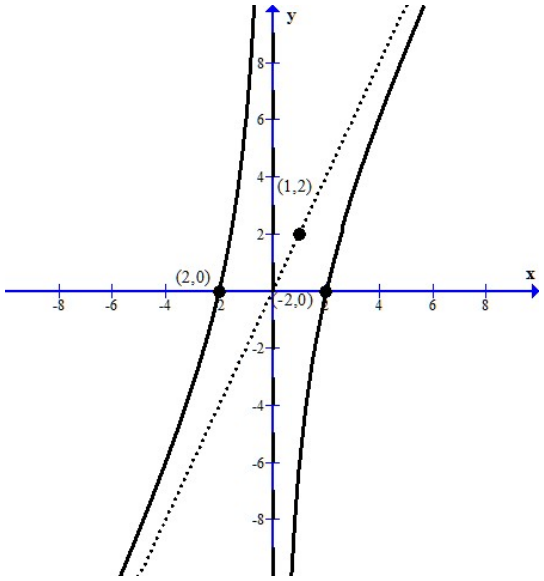
$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Example 3



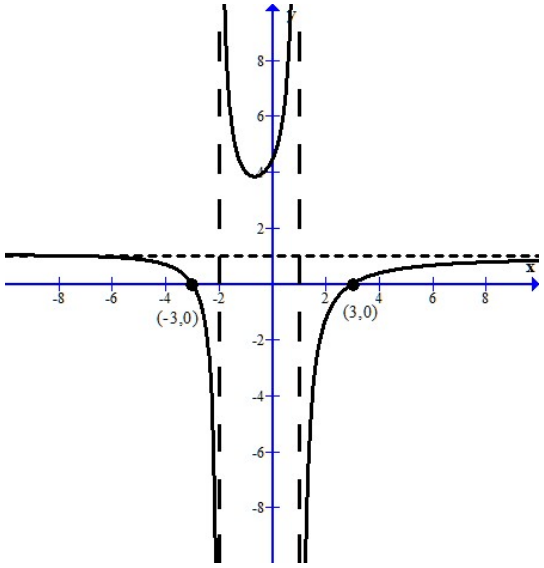
$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Example 4



$f(x) > 0$

$f(x) \geq 0$

$f(x) < 0$

$f(x) \leq 0$

▼ Solving Rational Inequalities Algebraically

▼ Example 1: Solve $\frac{x+4}{x-3} > 0$ and $\frac{x+4}{x-3} \leq 0$

▼ Example 2: Solve $\frac{x^2-9}{x^2+3x-10} \geq 0$

▼ Example 3: Solve $\frac{5x-4}{x+1} > 4$

▼ Example 4: Suppose that the daily cost C of manufacturing x bicycles is given by $C(x) = 50x + 6000$. Now the average daily cost is given by $\bar{C}(x) = \frac{50x+6000}{x}$. How many bicycles must be produced each day in order for the average cost to be no more than $110?