
Due: 12/14/2015 at 06:00am EST.

Students will be able to:
- Use zeros of polynomials and Intermediate Value Theorem to solve polynomial inequalities
- Use Intermediate Value Theorem to solve rational inequalities

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt) Solve the following inequality. Express the answer in interval notation.
   \[2x^2 + x ≥ 7\]
   Answer: 

2. (1 pt) Solve the following inequality. Express the answer in interval notation.
   \[(x - 10)(x - 19) > 0\]
   Answer: 

3. (1 pt) Solve the following inequalities. Enter the answers in interval notation.
   (a) \[x^2 + 7x - 8 ≤ 0\]
   Answer: 
   (b) \[9x^2 + x + 8 > 0\]
   Answer: 

4. (1 pt) Solve the following inequality. Express the answer in interval notation.
   \[x^4 > 4x^2\]
   Answer: 

5. (1 pt) Solve the following inequalities. Express the answers in interval notation.
   Suggestion: First answer part (a) using techniques from class and/or the text. Then, notice that parts (b)-(e) are modifications of part (a). Think about how these modifications affect the problem. Then solve parts (b)-(e) based on your answer to part (a). If you are not able to see the connections, you can always work the entire method.
   (a) \[\frac{x+16}{x^2-1} > 0\]
   Answer: 
   (b) \[\frac{x+16}{x^2-1} ≥ 0\]
   Answer: 
   (c) \[\frac{x+16}{x^2-1} ≤ 0\]
   Answer: 
   (d) \[\frac{(x+16)^2}{x^2-1} ≥ 0\]
   Answer: 
   (e) \[\frac{(x+16)^{10.001}}{(x^2-1)^{10.003}} ≥ 0\]
   Answer: 

6. (1 pt) Solve the following inequality. Enter the answer in interval notation.
   \[\frac{x}{x-7} > -2\]
   Answer: 

7. (1 pt) Solve the following inequality. Enter the answer in interval notation.
   \[\frac{(x-20)^2(x+1)^3}{(x-28)^4} > 0\]
   Answer: 

8. (1 pt) Solve the following inequality. Enter the answer in interval notation.
   \[\frac{x-8}{x-5} ≤ -8\]
   Answer: 

9. (1 pt) Solve the following inequality. Enter the answer in interval notation.
   \[\frac{3-x}{x-10} ≥ 0\]
   Answer: 

10. (1 pt) Solve the inequality
    \[\frac{(x-7)^4(x-40)^13}{x-1316} ≥ 0\]
    Give your answer in interval notation.
    \[x ∈ \ldots\]
    Note: Enter your answer without spaces. If you need - inf, type -inf. If you need inf, type inf. Remember that punctuation is important.

11. (1 pt) Solve the following inequality. Write the answer in interval notation. Note: If the answer includes more than one interval write the intervals separated by the “union” symbol, U. If needed enter ∞ as infinity and -∞ as -infinity.
    \[\frac{1}{x-3} \leq \frac{1}{x-4}\]
    Answer: 

12. (1 pt) Solve the following inequality. Write the answer in interval notation. If the answer involves more than one interval, write the intervals separated by the “union” symbol, U. If needed enter −∞ as - infinity and ∞ as infinity.
    \[\frac{6}{x-1} - \frac{6}{x} ≥ 1\]
    Answer: 

13. (1 pt) Consider the inequality

\[ \frac{x - 5}{x^3(x + 1)} > 0 \]

The solution of this inequality consists of one or more of the following intervals: \((-\infty, A), (A, B), (B, C), \) and \((C, \infty)\) where \(A < B < C\).

Find A ____
Find B ____
Find C ____

For each interval, answer YES or NO to whether the interval is included in the solution.

\((-\infty, A) ____
\(A, B) ____
\(B, \infty) ____

14. (1 pt) Consider the inequality

\[ \frac{x + 6}{x + 7} < -3 \]

The solution of this inequality consists one or more of the following intervals: \((-\infty, A), (A, B), \) and \((B, \infty)\) where \(A < B\).

Find A ____
Find B ____

For each interval, answer YES or NO to whether the interval is included in the solution.

\((-\infty, A) ____
\(A, B) ____
\(B, \infty) ____