

MTH 30 LECTURE NOTES (Ojakian)

Topic 6: Solving Inequalities

OUTLINE

References: 1.6

1. Absolute Value In Equations
 2. Absolute Value In Inequalities
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1. Solving Equations with Absolute Value

(a) Strategy:

- i. Isolate absolute value
- ii. Set inside absolute value to positive and negative of other side
- iii. Check that solutions do not make absolute value = negative!

(b) Problems

- i. $|x| = 7$
- ii. $|x| = -7$
- iii. $|5x + 2| - 4 = 9$

2. Solving Inequalities with Absolute Value

(a) Strategy:

- i. Isolate absolute value (so positive number on other side)
- ii. Cases on $>$ versus $<$ (for A positive)
 - A. If $|blah| < A$, then solve $-A < blah < A$
 - B. If $|blah| > A$, then solve: $blah > A$ OR $blah < -A$
- iii. Solve

(b) Another Strategy:

- i. Find the two numbers where $blah = A$ and $blah = -A$.
- ii. These two points break up the number line into 3 intervals.
- iii. Use test points to decide which of the 3 intervals to keep.

(c) Problems

Textbook Section 1.6, exercises: 31, 29, 30

Problem: $-\frac{1}{2}|4x - 5| < -3$

Application: Section 1.6, exercise 62