

**A Review of Inequalities**  
**or**  
**“More fun with sign diagrams!”**

Engagement Activity for Sections 2.4, 3.3, 4.3, 5.3, 6.3 and 6.4 of Precalculus, Third Edition, Stitz and Zeager

Primary Sections: 2.4, 3.3, 4.3, 5.3, 6.3, 6.4

Secondary Section: None

Key Concepts: Inequalities

This activity is designed to help you review all of the inequalities presented in the textbook and can be used as a portion of your review for the Final Exam. Your professor will have specific instructions as to how he/she wants the activity to fit into the class so please pay attention in class when this activity is assigned.

Solve the inequality analytically using either an approved short-cut discussed in class or a sign diagram. In either case, express your answer using interval notation.

1.  $|3x - 1| < 7$

2.  $|2 - x| + 4 \geq 13$

3.  $4 < |2x - 9| \leq 23$

4.  $|x + 10| \geq |4x - 1|$

5.  $x^2 + 4x - 5 \geq 0$

6.  $x^2 + 16 \leq 8x$

7.  $5x^2 + 3x - 13 \geq 0$

8.  $5x^2 - 3x + 13 < 0$

$$9. -6(x+7)(x-5)\left(x-\frac{13}{5}\right) \geq 0$$

$$10. 2x^3 + x^2 - 6x - 3 < 0$$

$$11. x^4 + 5x^3 - 14x^2 - 36x + 72 \leq 0$$

$$12. (x^2 + 12)(x - 7)(4x + 3) > 0$$

$$13. \frac{x+11}{x^2-9} > 0$$

$$14. \frac{3x^2 - 5x - 2}{x^2 - 4} \leq 0$$

$$15. \frac{2x+17}{x+1} > x+5$$

$$16. \frac{3x-1}{x^2+1} \leq 1$$

$$17. 2(x-2)^{-\frac{1}{3}} - \frac{2}{3}x(x-2)^{-\frac{4}{3}} \leq 0$$

$$18. -\frac{4}{3}(x-2)^{-\frac{4}{3}} + \frac{8}{9}x(x-2)^{-\frac{7}{3}} \geq 0$$

$$19. 1000(1.005)^{12t} \geq 2000$$

$$20. e^x > 4653$$

$$21. \frac{210}{1+29e^{-0.4t}} \geq 130$$

$$22. 70 + 90e^{-0.1t} < 85$$

$$23. 10 \log \left( \frac{x}{10^{-12}} \right) \geq 100$$

$$24. 3.6 \leq \log \left( \frac{x}{10^{-3}} \right) \leq 5.1$$

## Student Questionnaire for A Review of Inequalities

This Engagement Activity was created with one purpose in mind - to help you the student better understand the concepts presented in College Algebra. Whereas we think the activity does its job, the truth is that we need to know from you if it actually helped you learn. Please take a few minutes to complete this questionnaire anonymously and return it to your instructor. Your feedback will be used to improve the activity for next semester.

1. For Questions 1a through 1e below, please place an X in the box which most closely matches your opinion.

- (a) Before I began the activity, my understanding of the material was best described as

Clueless	Not so good	Meh	Pretty good	I pwned it!

- (b) After completing the activity, my understanding of the material is best described as

Clueless	Not so good	Meh	Pretty good	I pwn it!

- (c) The connection between the activity and the course material was clear

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

- (d) The activity's instructions were clear

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

- (e) The activity was a good use of class time

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. What did you like about the activity?

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3. How can we improve the activity?

4. Other comments: