Fractional Exponents Revisited
or
"More practice solving inequalities with fractional exponents."

Engagement Activity for Section 5.3 of Precalculus, Third Edition, Stitz and Zeager

Primary Section: 5.3
Secondary Section: None
Key Concepts: Simplifying expressions that involve fractional exponents, inequalities

This activity is designed to help you more fully understand the concepts presented in Section 5.3 of the textbook. It is not a replacement for the regular homework, but rather, is for additional practice. 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.

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Part One: Solve the inequalities using either the Factoring Approach or the Common Denominator Approach as discussed in the textbook. Be sure to include a neatly drawn sign diagram with each inequality and express your solution using interval notation.

1. $\frac{3}{2}x(x+1)^{1/2} + (x+1)^{3/2} \leq 0$

2. $(x+1)^{2/3} + \frac{2}{3}x(x+1)^{-1/3} \geq 0$

3. $2x^{4/5}(x-5) + \frac{4}{5}x^{-1/5}(x-5)^2 < 0$

4. $\frac{1}{2}x^{4/5}(x-5)^{-1/2} + \frac{4}{5}x^{-1/5}(x-5)^{1/2} > 0$

5. $\frac{1}{5}x^{2/3}(x+1)^{-4/5} + \frac{2}{3}x^{-1/3}(x+1)^{1/5} \leq 0$

6. $\frac{1}{4}(x-3)^{3/5}(x+4)^{-3/4} + \frac{3}{5}(x+4)^{1/4}(x-3)^{-2/5} \geq 0$

7. $(x^2+1)^{-1/2} - x^2(x^2+1)^{-3/2} > 0$

8. $3(x-5)^2(x+1)^{-2/5} - \frac{2}{5}(x-5)^3(x+1)^{-7/5} < 0$

9. $\frac{1}{3}x^{-2/3}(x+1)^{-4/5} - \frac{4}{5}x^{1/3}(x+1)^{-9/5} \leq 0$

10. $-\frac{1}{2\sqrt{(x+1)^3}\sqrt{x-3}} - \frac{1}{2\sqrt{x+1}\sqrt{(x-3)^3}} \geq 0$

11. $\sqrt{1-x^2} - \frac{x^2}{\sqrt{1-x^2}} > 0$

12. $\frac{1}{\sqrt{1-x^2}} + \frac{x^2}{\sqrt{(1-x^2)^3}} < 0$

Part Two: The Take-Home Challenge! Solve the inequality using either the Factoring Approach or the Common Denominator Approach as discussed in the textbook. Be sure to include a neatly drawn sign diagram with your answer and express your solution using interval notation.

13. $\frac{1}{3}x^{-2/3}(x-1)^{2/5}(x+1)^{-1} + \frac{2}{5}x^{1/3}(x-1)^{-3/5}(x+1)^{-1} - x^{1/3}(x-1)^{2/5}(x+1)^{-2} > 0$

Student Questionnaire for
Fractional Exponents Revisited

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?

Continued on back $\longrightarrow$

3. How can we improve the activity?

4. Other comments: