

Intermediate Algebra
Practice Exam 2
Section 7.1 – 7.6, 9.2

NAME:

Use the test itself as scratch paper. Print your name at the top of your test. Show work for possible partial credit. No expressions that you are asked to factor will be prime. The symbols \cdot and $*$ both indicate multiplication. The number in parentheses is the point value of the question.

Leave your answers as reduced fractions or write them as decimal answers, rounded to two decimal places. (This means if your answer is left in decimal form, there should be two digits to the right of the decimal point.) If an answer turns out to be undefined, say so specifically. Circle your final answers. Good luck!

1. (3) We say that the fraction $\frac{4}{12}$ is equivalent to $\frac{1}{3}$. Explain this using the fact that $\frac{4}{12}$ can be broken down as $\frac{1*4}{3*4}$. Explain **specifically why** the 4's can be left out to write $\frac{4}{12}$ as simply $\frac{1}{3}$.

2. (4) Let $r(x) = \frac{3x+9}{x^2+2x+1}$. Find $r(3)$.

3. (3) Perform the indicated operation and simplify.

$$\frac{x^2}{x-4} - \frac{x+12}{x-4}$$

4. (3) Verify that the expressions $2x-5$ and $5-2x$ are opposites. In other words, choose any value for x and substitute it into these two different expressions. Simplify each so that it is obvious that they are opposites.

5. (4) Simplify the following.

$$\frac{x^2 - 7x + 12}{(9 - x^2)(x + 5)}$$

6. (3) Perform the indicated operation and simplify.

$$\frac{x^2 + 2x - 24}{x^2 - x - 12} \cdot \frac{x^2 + 5x + 6}{x^2 + 8x + 12}$$

7. (3) Perform the operation indicated and simplify.

$$\frac{4}{x+2} - \frac{5}{x-4}$$

8. (3) Marie can mow the lawn in 5 hours. Joe can do the same job in 7 hours. If they work together, how long will it take the two of them to mow the lawn? Be sure to define your variable, solve the problem using algebra, and include units in your answer.

9. (3) Solve the following equation. Visibly check your answers and be sure to cross out any that turn out to be wrong.

$$\frac{3}{x-7} = \frac{7}{x+5}$$

10. (3) Solve the following equation. Check your answers and be sure to cross out any that turn out to be wrong.

$$\frac{4}{x+4} + \frac{3}{x-4} = \frac{24}{x^2-16}$$

11. (3) Solve the following equation.

$$|4x+2| - 5 = 10$$

12. (3) If two numbers have the same absolute value, what must be true of the numbers? In other words, if we say $|x| = |y|$, what can we say about x and y ? (Hint: There are two possibilities here.)

These are multiple-choice questions. Write the letter of your choice in the blank provided.

13. (3) Simplify.

13. _____

$$\frac{x^2 - 6x + 5}{2x^2 + x - 3}$$

a.) $\frac{3}{2+x}$

b.) $\frac{x-5}{2x+3}$

c.) $\frac{x-5}{2x-3}$

d.) $\frac{x+6}{2x+3}$

e.) $\frac{0}{0}$

14. (3) What makes a rational expression or a fraction “undefined”?

14. _____

- a.) The denominator has a value of zero.
- b.) The numerator has a value of zero.
- c.) Not being able to add it to another rational expression or fraction.
- d.) Not being able to find its reciprocal.
- e.) Not being able to find a least common denominator.

15. (3) Solve the following equation.

15. _____

$$2|5x-3|+7=21$$

a.) $x = 2$

b.) $x = \frac{17}{5}$

c.) $x = \frac{17}{5}$ or $x = -\frac{17}{5}$

d.) $x = 2$ or $x = \frac{4}{5}$

e.) $x = 2$ or $x = -\frac{4}{5}$