

Math 95 HW 13 (6.5) Simplifying Complex Fractions

Name: _____

Concepts and Vocabulary:

1. $\frac{\frac{5}{7}}{\frac{3}{11}} =$

5. Write the phrase “the quantity z plus three-fourths divided by the quantity z minus three-fourths” as a complex fraction.

4. Explain what a complex fraction is.

6. Write the expression $\frac{a}{b} \div \frac{a-b}{a+b}$ as a complex fraction.

Simplifying Complex Fractions:

In exercises 7 - 47, simplify the complex fraction. Leave your answer in factored form when appropriate.

7. $\frac{\frac{1}{5}}{\frac{4}{7}}$

9. $\frac{1 + \frac{1}{3}}{1 - \frac{1}{3}}$

$$11. \frac{2 + \frac{2}{3}}{2 - \frac{1}{4}}$$

$$17. \frac{\frac{8}{n+1}}{\frac{4}{n-1}}$$

$$13. \frac{\frac{a}{b}}{\frac{3a}{2b^2}}$$

$$19. \frac{\frac{2k+3}{k}}{\frac{k-4}{k}}$$

$$15. \frac{\frac{x}{2y}}{\frac{2x}{3y}}$$

$$21. \frac{\frac{3}{z^2-4}}{\frac{z}{z^2-4}}$$

$$23. \frac{\frac{x}{x^2 - 16}}{\frac{1}{x - 4}}$$

$$29. \frac{\frac{1}{x} + \frac{2}{x^2}}{\frac{3}{x} - \frac{1}{x^2}}$$

$$25. \frac{1 + \frac{1}{x}}{x + 1}$$

$$31. \frac{\frac{1}{x + 3} + \frac{2}{x - 3}}{2 - \frac{1}{x - 3}}$$

$$27. \frac{\frac{1}{x - 3}}{\frac{1}{x} - \frac{3}{x - 3}}$$

$$33. \frac{\frac{4}{x - 5}}{\frac{1}{x + 5} + \frac{1}{x}}$$

$$35. \frac{\frac{1}{p^2q} + \frac{1}{pq^2}}{\frac{1}{p^2q} - \frac{1}{pq^2}}$$

$$41. \frac{3^{-1} - 4^{-1}}{5^{-1} + 4^{-1}}$$

$$37. \frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{b} - \frac{1}{a}}$$

$$43. \frac{m^{-1}2n^{-2}}{1 + (mn)^{-2}}$$

$$39. \frac{\frac{1}{x} + \frac{1}{x+1}}{\frac{2}{x+1} - \frac{1}{x+1}}$$

$$45. \frac{1 - (2n+1)^{-1}}{1 + (2n+1)^{-1}}$$

$$47. \frac{\frac{x}{x^2 - 4} - \frac{1}{x^2 - 4}}{\frac{1}{x + 4}}$$

Applications:

49. If P dollars are deposited every month in an account paying an annual interest rate r expressed as a decimal, then the amount A in the account after 2 years can be approximated by

$$\left(P \left(1 + \frac{r}{12} \right)^{24} - P \right) \div \frac{r}{12}.$$

Write this expression as a complex fraction.

51. Light bulbs are often wired so that electricity can flow through either bulb as illustrated in the figure shown in the text. In this way, if one bulb burns out, the other bulb still works. If two light bulbs have resistances R_1 and R_2 , then their combined resistance R is given by the complex fraction

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}.$$

Simplify this formula.

53. If a person practices doing a task, he or she usually gets faaster at completing the task. This observation can be modeled by

$$T(x) = \frac{10}{\frac{1}{10}x + \frac{9}{10}},$$

where $T(x)$ gives the time in seconds to perform a simple task after practicing x times.

- a. Evaluate $T(11)$ and interpret the result. b. Rewrite $T(x)$ as a fraction in standard form $\frac{a}{b}$, without using decimals.