Advanced Algebra   Name _____
Homework 9.2
Add and Subtract Rational Functions   Period _____

SHOW ALL WORK.

Complete Parts A & B OR Parts B & C

<u>**PART A:**</u>

Find the least common multiple of the polynomials.

1. $3x$ and $3(x - 2)$ **2.** $2x^2$ and $4x + 12$ **3.** $2x$ and $2x(x - 5)$

Perform the indicated operation and simplify.

4. $\dfrac{15}{4x} + \dfrac{5}{4x}$ **5.** $\dfrac{x}{16x^2} - \dfrac{4}{16x^2}$ **6.** $\dfrac{9}{x+1} - \dfrac{2x}{x+1}$

7. $\dfrac{12}{5x} + \dfrac{7}{6x}$ **8.** $\dfrac{8}{3x^2} - \dfrac{5}{4x}$ **9.** $\dfrac{x-4}{5x} - \dfrac{12}{5(x-4)}$

<u>**PART B:**</u>

Find the least common multiple of the polynomials.

10. $24x^2$ and $8x^2 - 16x$ **11.** $x^2 - 25$; x; and $x - 5$ **12.** $9x^2 - 16x$ and $3x^2 - 2x - 8$

Perform the indicated operation and simplify.

13. $\dfrac{x^2-5}{x^2+5x-14} - \dfrac{x+3}{x+7}$

14. $\dfrac{x}{x^2-9} + \dfrac{x+1}{x^2+6x+9}$

15. $\dfrac{x+3}{x^2-2x-8} - \dfrac{x-5}{x^2-12x+32}$

16. If two resistors in a parallel circuit have resistances R_1 and R_2 (both in ohms), then the total resistance R_t is given by the equation shown. Simplify the complex fraction. Then find the total resistance if $R_1 = 2000$ ohms and $R_2 = 5600$ ohms.

$$R_t = \dfrac{1}{\dfrac{1}{R_1}+\dfrac{1}{R_2}}$$

<u>PART C:</u>

Perform the indicated operation and simplify.

17. $\dfrac{x+2}{x-4} + \dfrac{2}{x} + \dfrac{5x}{3x-1}$

18. $\dfrac{x+3}{x^2-25} - \dfrac{x-1}{x-5} + \dfrac{3}{x+3}$

19. If you borrow P dollars to buy a car and agree to repay the loan over t years at a monthly interest rate of i (expressed as a decimal), then your monthly payment M is given by either formula below.

Formula 1: $M = \dfrac{Pi}{1-(\dfrac{1}{1+i})^{12t}}$

Formula 2: $M = \dfrac{Pi(1+i)^{12t}}{(1+i)^{12t}-1}$

a) Show that the formulas are equivalent by simplifying the first formula.

b) Find your monthly payment if you borrow \$15,500 at a monthly interest rate of 0.5% and repay the loan over 4 years.

20. Find the next two expressions in the pattern shown. Then simplify all five expressions. What value do the expressions approach?

$$1+\dfrac{1}{2+\dfrac{1}{2}}\;;\; 1+\dfrac{1}{2+\dfrac{1}{2+\dfrac{1}{2}}}\;;\; 1+\dfrac{1}{2+\dfrac{1}{2+\dfrac{1}{2+\dfrac{1}{2}}}}$$

Unit 9.2 Homework Answers

1. $3x(x-2)$ **2.** $4x^2(x+3)$ **3.** $2x(x-5)$ **4.** $\dfrac{5}{x}$

5. $\dfrac{x-4}{16x^2}$ **6.** $\dfrac{9-2x}{x+1}$ **7.** $\dfrac{107}{30x}$ **8.** $\dfrac{32-15x}{12x^2}$

9. $\dfrac{x^2-20x+16}{5x(x-4)}$ **10.** $24x^2(x-2)$ **11.** $x(x-5)(x+5)$ **12.** $(x-2)(3x+4)(3x-4)$

13. $\dfrac{-x+1}{(x+7)(x-2)}$ **14.** $\dfrac{2x^2+x-3}{(x-3)(x+3)^2}$ **15.** $\dfrac{-2x-14}{(x-4)(x+2)(x-8)}$ **16.** $R_t=\dfrac{R_1\cdot R_2}{R_1+R_2}$; 1474 ohms

17. $\dfrac{8x^3-9x^2-28x+8}{x(x-4)(3x-1)}$ **18.** $\dfrac{-x^3-3x^2-x-51}{(x-5)(x+5)(x+3)}$ **19b.** \$364.02

20b. $\dfrac{7}{5};\dfrac{17}{12};\dfrac{41}{29};\dfrac{99}{70};\dfrac{239}{169}$ $\sqrt{2}$