4-4 Additional Practice

Adding and Subtracting Rational Expressions

Find the LCM for each group of expressions.

1. $2x^2 - 8x + 8$ and
   $3x^2 + 27x - 30$

   $6(x - 1)(x - 2)^2(x + 10)$

2. $4x^2 + 12x + 9$ and
   $4x^2 - 9$

   $(2x + 3)^2(2x - 3)$

3. $2x^2 - 18$ and
   $5x^3 + 30x^2 + 45x$

   $10x(x + 3)^2(x - 3)$

Find the sum.

4. $\dfrac{6y - 4}{y^2 - 5} + \dfrac{3y + 1}{y^2 - 5}$

   $\dfrac{9y - 3}{y^2 - 5}; y \neq \pm\sqrt{5}$

5. $\dfrac{x + 2}{x^2 + 4x + 4} + \dfrac{2}{x + 2}$

   $\dfrac{3}{x + 2}; x \neq -2$

6. $\dfrac{4}{x^2 - 25} + \dfrac{6}{x^2 + 6x + 5}$

   $\dfrac{10x - 26}{(x + 5)(x - 5)(x + 1)};$
   $x \neq -1, \pm5$

Find the difference.

7. $-\dfrac{2}{n + 4} - \dfrac{n^2}{n^2 - 16}$

   $\dfrac{2 - n}{n - 4}; n \neq \pm4$

8. $\dfrac{3}{8x^3y^3} - \dfrac{1}{4xy}$

   $\dfrac{3 - 2x^2y^2}{8x^3y^3}; x, y \neq 0$

9. $\dfrac{y}{4y + 8} - \dfrac{1}{y^2 + 2y}$

   $\dfrac{y - 2}{4y}; y \neq -2, 0$

Simplify.

10. $\dfrac{\frac{2}{x} + 6}{\frac{1}{y}}$ **$\dfrac{2y + 6xy}{x}$**

11. $\dfrac{\frac{x + 3}{x - 3}}{\frac{x^2 - 9}{3x - 9}}$ **$\dfrac{3}{x - 3}$**

12. $\dfrac{\frac{5}{x + 3}}{2 + \frac{1}{x + 3}}$ **$\dfrac{5}{2x + 7}$**

13. At an amusement park, guests have to take either a train or a boat 4 miles from the parking lot to the front entrance and then back when they leave the park. The train goes 10 mph faster than the boat. Abdul takes the train into the park and the boat on his way back. The boat goes an average speed of 20 mph. How long did the round trip take?
    20 minutes

14. What is the disadvantage of adding two rational expressions using a common denominator that is not the least common denominator?
    Sample answer: Adding by using a common denominator that is not the LCD, means you will have to divide out the common factor(s) after adding.