

Bellwork: Find the least common denominator and add the fractions

$$\frac{2 \cdot 4}{2 \cdot 7} + \frac{5}{14}$$

$$\frac{8}{14} + \frac{5}{14} = \frac{13}{14}$$

$$\frac{4 \cdot 2}{4 \cdot 3} + \frac{5 \cdot 3}{4 \cdot 3}$$

$$\frac{8}{12} + \frac{15}{12} = \frac{23}{12}$$

$$\frac{2 \cdot 3}{2 \cdot 35} + \frac{7 \cdot 7}{10 \cdot 7}$$

$$\frac{6}{70} + \frac{49}{70} = \frac{55}{70}$$

$$\frac{7 \cdot 7}{10 \cdot 5} - \frac{3 \cdot 5}{14 \cdot 5}$$

$$\frac{49 - 15}{70} = \frac{34}{70}$$

$$\frac{11}{14}$$

$$\frac{17}{35}$$

Homework 4.2,4.3 Solutions

1) $\frac{90x^3}{40x^2}$

$$\frac{9x}{4}; \{0\}$$

3) $\frac{42x^2 + 54x}{24x}$

$$\frac{7x+9}{4}; \{0\}$$

5) $\frac{r^2 - 7r - 30}{r^2 - 12r + 20}$

$$\frac{r+3}{r-2}; \{10, 2\}$$

7) $\frac{2a^2 + 16a - 40}{3a^3 + 36a^2 + 60a}$

$$\frac{2(a-2)}{3a(a+2)}; \{0, -10, -2\}$$

9) $\frac{p+3}{p^2+7p+12} \cdot \frac{10p+40}{10}$

$$1$$

11) $\frac{10r-20}{r-7} \cdot \frac{r^2-8r+7}{r^2+7r-8}$

$$\frac{10(r-2)}{r+8}$$

13) $\frac{x+9}{7} \div \frac{x-5}{7x-35}$

$$x+9$$

15) $\frac{v^2+12v+27}{v^2-14v+48} \div \frac{v^2+8v-9}{v^2-9v+8}$

$$\frac{v+3}{v-6}$$

17) $f(x) = x^5 + 5x^4 - 7x^3 - 39x^2$

$$5$$

2) $\frac{v^2 - 3v - 70}{v + 7}$

$$v - 10; \{-7\}$$

4) $\frac{6x^3 - 6x^2}{x^2 + 7x - 8}$

$$\frac{6x^2}{x+8}; \{1, -8\}$$

6) $\frac{4x+4}{4x+2}$

$$\frac{2(x+1)}{2x+1}; \left\{-\frac{1}{2}\right\}$$

8) $\frac{7r^2 + 14r}{r^2 - 2r - 63}$

$$\frac{7r(r+2)}{(r-9)(r+7)}; \{9, -7\}$$

10) $\frac{r-1}{r-2} \cdot \frac{3r-6}{r-1}$

$$3$$

12) $\frac{x+4}{9x+36} \cdot \frac{3x+6}{3x+30}$

$$\frac{x+2}{9(x+10)}$$

14) $\frac{7}{20x+80} \div \frac{1}{20x+80}$

$$7$$

16) $\frac{x-9}{x^2-5x+4} \div \frac{9x^2-81x}{9x^2-27x}$

$$\frac{x-3}{(x-4)(x-1)}$$

18) $f(x) = x^9 - 8x^6 - x^3 + 8$

$$9$$

$$7) \frac{2a^2 + 16a - 40}{3a^3 + 36a^2 + 60a} \quad \frac{2(a^2 + 8a - 20)}{3a(a^2 + 12a + 20)}$$

$$\frac{2(a+10)(a-2)}{3a(a+10)(a+2)}$$

$$= \frac{2(a-2)}{3a(a+2)}$$

$$15) \frac{v^2 + 12v + 27}{v^2 - 14v + 48} \div \frac{v^2 + 8v + 9}{v^2 - 9v + 8}$$

$$\frac{(v+3)(v+9)}{(v-6)(v-8)} \cdot \frac{(v-1)(v-8)}{(v+9)(v-1)} = \frac{(v+3)}{v-6}$$

Lesson 4.4 Objectives:

I can add and subtract rational expressions

To add or subtract rational expressions, find a common denominator then add or subtract the numerators.

$$\frac{a}{b} + \frac{c}{d} = \frac{a \cdot \cancel{d}}{\cancel{d} \cdot b} + \frac{c \cdot \cancel{b}}{\cancel{b} \cdot d} = \frac{ad}{bd} + \frac{cb}{bd} = \frac{ad + cb}{bd}$$

or

$$\frac{a}{b} - \frac{c}{d} = \frac{a \cdot \cancel{d}}{\cancel{d} \cdot b} - \frac{c \cdot \cancel{b}}{\cancel{b} \cdot d} = \frac{ad}{bd} - \frac{cb}{bd} = \frac{ad - cb}{bd}$$

$$\frac{5}{5} \cdot \frac{2}{3} + \frac{4}{5} \cdot \frac{3}{3} \qquad \frac{10 + 12}{15} = \frac{22}{15}$$

$$\frac{10}{15} + \frac{12}{15}$$

1. Find the least common multiple of each:

a. $10x^2y$ and $12y^3$

b. $x + 1$ and $x^2 - 1$

c. $x^2 + 11x + 24$ and $x^2 + 15x + 56$

a) $\frac{6 \cdot 1 \cdot y^2}{10x^2y} + \frac{1 \cdot 5x^2}{12y^3x^2} = \frac{2 \cdot 5 \cdot 6x^2y^3}{60x^2y^3}$

$6 \cdot 5 \cdot 2$ $6 \cdot 2 \cdot 5$

b) $\frac{1(x-1)}{(x-1)(x+1)} + \frac{1}{(x+1)(x-1)}$

$(x+1)(x-1)$

c) $\frac{1(x+7)}{x^2+11x+24} + \frac{1(x+3)}{x^2+15x+56} = \frac{(x+8)(x+3)(x+7)}{(x+8)(x+3)(x+7)}$

$(x+8)(x+3)$ $(x+7)(x+8)$ $(x+7)$ $(x+3)$

$$2. \text{ Add: } \frac{3}{7x} + \frac{4}{7x} = \frac{\cancel{7}}{\cancel{7}x} = \left(\frac{1}{x} \right)$$

$$\frac{3+4}{7x}$$

$$3. \text{ Subtract: } \frac{x-3}{x-5} - \frac{7-x}{x-5} = \frac{x-3-(7-x)}{x-5}$$

$$\frac{x-3-7+x}{x-5} = \frac{2x-10}{x-5}$$

$$\frac{2(\cancel{x-5})}{\cancel{x-5}} = \textcircled{2}$$

4. Add: $\frac{1}{x+4} + \frac{8}{x^2-16}$

5. Subtract: $\frac{(x+1)x+2}{x^2-5x+4} - \frac{x(x-1)}{x^2-3x-4}$

$(x+1)(x-1)(x-4) \quad (x-4)(x+1)(x-1)$

$$\frac{(x+1)(x+2) - x(x-1)}{(x+1)(x-1)(x-4)} = \frac{x^2+2x+x+2 - x^2+x}{\text{blah}}$$

$$3) \frac{4n}{\cancel{15n^2 - 18n}} - \frac{6n(5n-6)}{\underline{3n}(5n-6)}$$

$$\underline{3n(5n-6)}$$

$$\frac{4n - \cancel{6n(5n-6)}}{3n(5n-6)} = \frac{4n - 30n^2 + 36n}{\text{blah}}$$

$$\frac{-30n^2 + 40n}{3n(5n-6)}$$

$$\frac{-10n(3n-4)}{\cancel{3n}(5n-6)}$$

$$\frac{-10(3n-4)}{3(5n-6)}$$