11.4 Adding & Subtracting Rational Expressions

* To add or subtract rational expressions with <u>like denominators</u>:
  1) add or subtract the numerator (combine like terms)
  2) write the sum or difference over the common denominator
  3) Simplify
* Review Problem 1 on pg. 684 & Problem 2 on pg. 685
* Got it 1) $\frac{2a}{3a-4} + \frac{3a}{3a-4} = \frac{5a}{3a-4}$
* Got it 2)

A) $\frac{2}{z+3} - \frac{7}{z+3} = \frac{-5}{z+3}$

B) $\frac{9n-3}{10n-4} - \frac{3n+5}{10n-4} = \frac{6n-8}{10n-4} = \frac{2(3n-4)}{2(5n-2)} = \frac{3n-4}{5n-2}$

C) $\frac{7q-3}{q^2-4} - \frac{6q-5}{q^2-4} = \frac{1q+2}{q^2-4} = \frac{q+2}{(q+2)(q-2)} = \frac{1}{q-2}$

Unlike Denominators

* To add or subtract rational expressions with unlike denominator
  1) find the least common denominator (LCD) / least common multiple (LCM) of the denominators
  2) multiply both the numerator & denominator of both fractions to get the LCD
  3) add or subtract the numerators & write the sum or difference over the LCM
  4) Simplify

Example: $\frac{2}{3} + \frac{4}{5}$

$$\frac{2(5)}{3(5)} + \frac{4(3)}{5(3)} = \frac{10}{15} + \frac{12}{15} = \frac{22}{15}$$

* Review Problem 3 on pg. 685

* Got it #3) $\frac{3}{7y^4} + \frac{2}{3y^2}$

$$3\left(\frac{3}{7y^4}\right) + \left(\frac{2}{3y^2}\right)7y^2$$

$$\frac{9}{21y^4} + \frac{14y^2}{21y^4} = \frac{14y^2+9}{21y^4}$$

* Review Problem 4 on pg. 686

* Got it 4) $\frac{c}{3c-1} - \frac{4}{c-2}$

$$c-2\left(\frac{c}{3c-1}\right) - \left(\frac{4}{c-2}\right)(3c-1) = \frac{c(c-2)}{(c-2)(3c-1)} - \frac{4(3c-1)}{(3c-1)(c-2)}$$

$$\frac{c^2-2c}{(c-2)(3c-1)} - \frac{12c-4}{(3c-1)(c-2)} = \frac{c^2-14c+4}{(c-2)(3c-1)}$$

11-4

pg. 687 #9-15 odd, 25-31 odd & 37-41 odd

9) $\frac{5}{c-5} + \frac{9}{c-5} = \frac{14}{c-5}$

11) $\frac{6c-28}{2c+7}$ OR $\frac{2(3c-14)}{2c+7}$

13) $\frac{n+2}{n^2+4n+4} = \frac{n+2}{(n+2)(n+2)} = \frac{1}{n+2}$

15) $\frac{2n+8}{n+4} = \frac{2(n+4)}{n+4} = 2$

25) $\left(\frac{7}{3a}\right) + \left(\frac{2}{5}\right)3a = \frac{35}{15a} + \frac{6a}{15a} = \frac{35+6a}{15a}$

27) $\left(\frac{27}{n^3}\right) - \left(\frac{9}{7n^2}\right)n = \frac{189}{7n^3} - \frac{9n}{7n^3} = \frac{9(21-n)}{7n^3}$

or

$\frac{189-9n}{7n^3}$

29) $\frac{a}{a+3} - \frac{4}{a+5}$ $a+5$ $a+3$ $= \frac{(a-3)(a+4)}{(a+3)(a+5)}$

$a(a+5) - 4(a+3)$

$a^2+5a - (4a+12)$

a^2+a-12

$(a-3)(a+4)$

31) $\frac{a}{4}\left(\frac{a}{a+3}\right) + \left(\frac{a+5}{4}\right)a+3 = \frac{a^2+12a+15}{4(a+3)}$

$4a + (a+5)(a+3)$

$4a + a^2+8a+15$

37) $\frac{y^2+2y-1}{3y+1} - \frac{2y^2-3}{3y+1} = \frac{-y^2+2y+2}{3y+1}$

39) $\frac{r-5}{9+p^3} - \frac{2k+1}{9+p^3} = \frac{-2k+r-6}{9+p^3}$

41) $\frac{9}{x+2}\left(\frac{1}{1}\right) + \frac{x-3}{x+2} = \frac{9x+18+x-3}{x+2} = \frac{10x+15}{x+2}$

$\frac{5(2x+3)}{x+2}$