RATIONAL FUNCTIONS = fractions! $\frac{2}{9} \cdot \frac{3}{8} = \frac{1}{12}$
$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad 3 \quad 4$

Simplify.

$$\frac{c^3 + 3c^2}{(c+5)^2} \cdot \frac{c^2 - 25}{c^2}$$

$$\frac{c^2(c+3)}{(c+5)^{2}\,{}^{1}} \cdot \frac{(c-5)(c+5)}{c^2}$$

$$= \frac{(c+3)(c-5)}{c+5}$$

$$\frac{2x^2 + 9x + 9}{1 - x^2} \div \frac{10x^2 + 19x + 6}{5x^2 + 7x + 2}$$

$$\frac{2x^2 + 9x + 9}{-(x^2 - 1)} \cdot \frac{5x^2 + 7x + 2}{10x^2 + 19x + 6}$$

$$\frac{(2x+3)(x+3)}{-(x+1)(x-1)} \cdot \frac{(5x+2)(x+1)}{(5x+2)(2x+3)}$$

$\frac{-1}{2}\quad \frac{1}{-2}$

$$= \boxed{\frac{-(x+3)}{x-1} \;\;\text{OR}\;\; \frac{-x-3}{x-1}}$$

Addition/Subtraction

$$1 \cdot \frac{1}{3} + \frac{2 \cdot 3}{7 \cdot 3}$$

$$= \frac{7}{21} + \frac{6}{21}$$

$$= \frac{13}{21}$$

$$3 \cdot \frac{m}{m^2 - 4} + \frac{2(m-2)}{3m+6}$$

$$\frac{m}{3(m+2)(m-2)} \quad \frac{2(m-2)}{3(m+2)(m-2)}$$

$$\frac{3m}{3(m+2)(m-2)} + \frac{2m-4}{3(m+2)(m-2)}$$

$$= \frac{5m-4}{3(m+2)(m-2)}$$

$$\frac{x(x+2)}{x^2+5x+6 \,(x+2)} + \frac{-2(x+3)}{x^2+4x+4 \,(x+3)}$$

$$\frac{x(x+2)}{(x+2)(x+3)} \quad \frac{-2(x+3)}{(x+2)(x+2)}$$

$$\frac{x^2+2x}{(x+2)^2(x+3)} + \frac{-2x-6}{(x+2)^2(x+3)}$$

$$= \frac{x^2-6}{(x+2)^2(x+3)}$$

<u>COMPLEX FRACTIONS</u> — fractions in a fraction

$$\cfrac{\dfrac{(n+1)\,n+5}{(n+1)\,1} - \dfrac{12}{n+1}}{n\cdot\dfrac{n+9}{n+1} + \dfrac{-5\,(n+1)}{n\,(n+1)}} = \cfrac{\dfrac{n^2+6n+5}{n+1} - \dfrac{12}{n+1}}{\dfrac{n^2+9n}{n(n+1)} + \dfrac{-5n-5}{n(n+1)}} = \cfrac{\dfrac{n^2+6n-7}{n+1}}{\dfrac{n^2+4n-5}{n(n+1)}}$$

$$= \frac{n^2+6n-7}{n+1} \cdot \frac{n(n+1)}{n^2+4n-5}$$

$$= \frac{(n+7)(n-1)}{n+1} \cdot \frac{n(n+1)}{(n+5)(n-1)}$$

$$= \frac{n(n+7)}{n+5}$$