Simplify. $\dfrac{6}{7x+28} - \dfrac{5}{x^3-16x}$

$x(x^2-16)$

$\dfrac{(x-4)}{(x-4)} \cdot \dfrac{x}{x} \cdot \dfrac{6}{7(x+4)} - \dfrac{5}{x(x+4)(x-4)} \cdot \dfrac{7}{7}$

$\dfrac{6x^2-24x-35}{7x(x-4)(x+4)}$

Simplify. $\dfrac{3}{x^2-6x+9} - \dfrac{5}{x^2-7x+12}$

$3x-12 \quad\quad 5x+15$

$\dfrac{(x-4)}{(x-4)} \cdot \dfrac{3}{(x-3)(x-3)} - \dfrac{5}{(x-3)(x-4)} \cdot \dfrac{(x-3)}{(x-3)}$

$-7 \quad 12$

$\dfrac{-2x+3}{(x-4)(x-3)(x-3)}$

Complex Fractions: (also known as Compound Fractions)
Fractions whose numerators and/or denominators also have fractions.

Simplify:

$\dfrac{\frac{8}{15}}{\frac{24}{35}}$

$\frac{8}{15} \div \frac{24}{35} \rightarrow$ multiply by the reciprocal $\rightarrow \dfrac{8^{1}}{15_{3}} \cdot \dfrac{35^{7}}{24_{3}} = \dfrac{7}{9}$

Simplify:

$\dfrac{3+\frac{4}{3}}{\frac{11}{6}-1}$

There are many methods to do this, I'll focus on two methods.

$$\frac{3+\frac{4}{3}}{\frac{11}{6}-1}$$

Find LCM of all the denominators in the complex fraction. Then multiply the top and bottom of the complex fraction by this LCM.

$$\frac{18+8}{11-6} = \frac{26}{5}$$

$$\frac{\frac{6}{6}\cdot\frac{3}{1}+\frac{4}{3}\cdot\frac{2}{2}}{\frac{11}{6}-\frac{1}{1}\cdot\frac{6}{6}}$$

Get ALL the "parts" of the complex fraction to have the LCD.
Then you can cancel all of the denominators.

$$\frac{\frac{18}{6}+\frac{8}{6}}{\frac{11}{6}-\frac{6}{6}} = \frac{18+8}{11-6} = \frac{26}{5}$$

Simplify:

$$\frac{\frac{2}{x}+\frac{5}{y^3}}{\frac{3}{x^2}-\frac{6}{y^2}}$$

$$\frac{x^2y^3}{x^2y^3}$$

$$\frac{2xy^3+5x^2}{3y^3-6x^2y}$$