COMPLEX FRACTIONS – Worksheet 1

Complex Fraction: A fraction that contains a fraction in its numerator or denominator. To simplify write the numerator as a single fraction, write the denominator as a single fraction, then multiply by the reciprocal of the denominator.

Simplify:

1. $\dfrac{\frac{2}{1}+\frac{3}{5}}{5+\frac{1}{4}}$ $\quad \frac{10}{5}+\frac{3}{5}=\frac{13}{5}$ $\quad \frac{20}{4}+\frac{1}{4}$ $\quad \dfrac{\frac{13}{5}}{\frac{21}{4}}$

$\frac{13}{5}\cdot\frac{4}{21}=\frac{52}{105}$

2. $\dfrac{\frac{3ab}{x}}{\frac{6a^2b}{x^2}}$ $\quad \frac{3ab}{x}\cdot\frac{x^2}{6a^2b}$ $\quad \frac{1x}{2a}$

3. $\dfrac{x+\frac{x}{y}}{1+\frac{1}{y}}$ $\quad \frac{xy}{y}+\frac{x}{y}=\frac{xy+x}{y}$ $\quad \frac{y+1}{y}$

$\frac{xy+x}{y}\cdot\frac{y}{y+1}=\frac{xy+x}{y+1}$

$\frac{x(y+1)}{y+1}=x$

4. $\dfrac{1+\frac{1}{2z}}{\frac{z}{1}-\frac{1}{4z}}$ $\quad \frac{2z+1}{2z}$ $\quad \frac{4z^2-1}{4z}$

$\frac{2z+1}{2z}\cdot\frac{4z}{4z^2-1}=\frac{2}{2z-1}$

5. $\dfrac{(z+1)-\frac{20}{z}}{(z-2)-\frac{8}{z}}$ $\quad \frac{z^2+z-20}{z}$ $\quad \frac{z^2-2z-8}{z}$

$\frac{(z+5)(z-4)}{z}\cdot\frac{z}{(z-4)(z+2)}$

$\frac{z+5}{z+2}$

6. $\dfrac{1+\frac{1}{a}+\frac{2}{a^2}}{2+\frac{5}{a}+\frac{2}{a^2}}$ $\quad \frac{a^2}{a^2}+\frac{a}{a^2}+\frac{2}{a^2}$ $\quad \frac{2a^2}{a^2}+\frac{5a}{a^2}+\frac{2}{a^2}$

$\frac{a^2+a+2}{x^2}\cdot\frac{x^2}{2a^2+5a+2}$

$\frac{a^2+a+2}{2a^2+5a+2}$

7. $\dfrac{1+\frac{2}{9}}{2-\frac{1}{3}}$ $\quad \frac{9+2}{9}$ $\quad \frac{6-1}{3}$

$\frac{11}{3}\cdot\frac{3}{5}=\frac{11}{15}$

8. $\dfrac{1+\frac{1}{a^2}}{1-\frac{1}{a^2}}$ $\quad \frac{a^2+1}{a^2}$ $\quad \frac{a^2-1}{a^2}$

$\frac{a^2+1}{a^2}\cdot\frac{a^2}{a^2-1}$

$\frac{a^2+1}{a^2-1}$

9. $\dfrac{2+\frac{1}{x}-\frac{1}{x^2}}{1+\frac{4}{x}+\frac{3}{x^2}}$ $\quad \frac{2x^2}{x^2}+\frac{x}{x^2}-\frac{1}{x^2}$ $\quad \frac{x^2}{x^2}+\frac{4x}{x^2}+\frac{3}{x^2}$

$\frac{2x^2+x-1}{x^2}\cdot\frac{x^2}{x^2+4x+3}$

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

$\frac{2x-1}{x+3}$

Answers: 1. $\frac{52}{105}$ 2. $\frac{x}{2a}$ 3. x 4. $\frac{2}{2z-1}$ 5. $\frac{z+5}{z+2}$ 6. $\frac{a^2+a+2}{2a^2+5a+2}$ 7. $\frac{11}{15}$ 8. $\frac{a^2+1}{a^2-1}$ 9. $\frac{2x-1}{x+3}$