

Section 6.5 - Complex Fractions

$$8. \quad \frac{\frac{3}{7}}{\frac{2}{9}} = \frac{3}{7} \cdot \frac{9}{2} = \frac{27}{14}$$

reciprocal

$$14. \quad \frac{\frac{7}{y}}{\frac{14}{y}} = \frac{\cancel{7}}{y} \cdot \frac{y}{\cancel{14}_2} = \frac{1}{2}$$

$$12. \quad \frac{\frac{\frac{1}{2} \cdot \frac{2}{2} + \frac{3}{4}}{\frac{1}{2} \cdot \frac{2}{2} - \frac{3}{4}}}{\text{LCD} = 4} = \frac{\frac{2}{4} + \frac{3}{4}}{\frac{2}{4} - \frac{3}{4}} = \frac{\frac{5}{4}}{-\frac{1}{4}}$$
$$= \frac{5}{\cancel{4}_1} \cdot \frac{-\cancel{4}_1}{1} = -5$$

$$32. \quad \frac{\frac{1}{x} + \frac{2}{x}}{\frac{1}{x-1} + \frac{x}{2}} \quad \text{LCD} = x$$
$$= \frac{\frac{1}{x-1} + \frac{x}{2}}{\text{LCD} = 2(x-1)} = \frac{\frac{1}{x-1} \cdot \frac{2}{2} + \frac{x}{2} \cdot \frac{x-1}{x-1}}{\frac{2}{2(x-1)} + \frac{x(x-1)}{2(x-1)}}$$
$$= \frac{\frac{3}{x}}{\frac{2 + x^2 - x}{2(x-1)}}$$

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

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

$$= \frac{6(x-1)}{x(x^2-x+2)}$$

leave in factored form

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

$$\frac{4}{x^2-9}$$

44. $\frac{1+p^{-2}}{1-p^{-2}}$ ^{reciprocal}

$$= \frac{\frac{1}{1} + \frac{1}{p^2}}{\frac{1}{1} - \frac{1}{p^2}} \quad \begin{array}{l} \text{LCD} \\ = p^2 \end{array}$$

$$\frac{p^{-2}}{1} = \frac{1}{p^2}$$

$$\frac{x^{-2}}{x^{-6}} = \frac{x^6}{x^2} = x^{6-2} = x^4$$

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

$$= \frac{\frac{p^2+1}{p^2}}{\frac{p^2-1}{p^2}}$$

$$= \frac{p^2+1}{p^2} \cdot \frac{p^2}{p^2-1} = \frac{p^2+1}{p^2-1} = \frac{p^2+1}{(p+1)(p-1)}$$