

Section 9.4 Combining Operations and Simplifying Complex Rational Expressions

1. The reciprocal of $\frac{1}{x} + \frac{1}{y}$ is

- (a) $x + y$
- (b) $\frac{x+y}{xy}$
- (c) $\frac{xy}{x+y}$
- (d) $\frac{1}{x+y}$

2. The reciprocal of $\frac{2}{x} + \frac{3}{y}$ is

- (a) $\frac{3x+2y}{xy}$
- (b) $\frac{x+y}{5}$
- (c) $\frac{x}{2} + \frac{y}{3}$
- (d) $\frac{xy}{3x+2y}$

3. The reciprocal of $\frac{1}{4} + \frac{1}{q}$ is

- (a) $\frac{1}{4+q}$
- (b) $\frac{4q}{4+q}$
- (c) $\frac{4+q}{4q}$
- (d) $4 + q$

4. Simplify: $\frac{\left(\frac{5x}{x+7}\right)}{\left(\frac{10}{x^2+8x+7}\right)}$

- (a) $\frac{50x}{x+1}$

(b) $\frac{x(x+1)}{2}$

(c) $\frac{2x}{(x+7)^2(x+1)}$

(d) $\frac{x}{2(x^2+8)}$

5. Simplify: $\frac{\left(4 + \frac{16}{x-4}\right)}{\left(5 + \frac{20}{x-4}\right)}$

(a) $\frac{4}{5}$

(b) $\frac{5}{4}$

(c) $\frac{4x+12}{5x+16}$

(d) $\frac{20}{(x-4)^2}$

6. Simplify: $\frac{\left(\frac{x}{y} - \frac{y}{x}\right)}{\left(\frac{1}{y} + \frac{1}{x}\right)}$

(a) $x - y$

(b) $x + y$

(c) $x^2 - y^2$

(d) $x^2 + y^2$