

Simplify each of the following. Make sure your answers are in simplest form.

$$1. \frac{\frac{x^2+3x-10}{x^2-5x+6}}{\frac{x^2-25}{x^2-4x-5}}$$

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

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

$$2. \frac{a^2-b^2}{\frac{ab}{\frac{b \cdot 1 + 1 \cdot a}{b \cdot a} \cdot \frac{1 \cdot a}{b \cdot a}}} = \frac{(a-b)(a+b)}{ab} \cdot \frac{ab}{(a+b)}$$

$$= a-b$$

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

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

$$4. \frac{x^2-16}{\frac{x^2-6x+9}{x^2-3x-4}}$$

$$= \frac{(x+4)(x-4)}{(x-3)(x-4)} \cdot \frac{(x-3)(x+1)}{(x-4)(x+1)}$$

$$= \frac{x+4}{x-3}$$

$$5. \frac{\frac{x^2+5x-6}{x^2+8x+12}}{\frac{x^2+2x-15}{x^2+9x+20}}$$

$$\frac{(x+6)(x-1)}{(x+6)(x+2)} \cdot \frac{(x+4)(x+5)}{(x+5)(x-3)}$$

$$= \frac{(x-1)(x+4)}{(x+2)(x-3)}$$

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

$$\frac{(x+y)(x^2+xy+y^2)}{(x+y)(x-y)} \cdot \frac{(x-y)(x-y)}{x^2-xy+y^2}$$

$$= x-y$$