

MAT 104 Quiz 20
Wednesday, November 3, 2004

1. Simplify

$$\frac{\frac{a}{b}}{\frac{b^2}{a}}$$

$$\begin{aligned}\frac{\frac{a}{b}}{\frac{b^2}{a}} &= \frac{a}{b} \cdot \frac{a}{b^2} \\ &= \frac{a^2}{b^3}\end{aligned}$$

2. Simplify

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

$$\begin{aligned}\frac{\frac{x^3+y^3}{x^2}}{\frac{x+y}{x}} &= \frac{x^3+y^3}{x^2} \cdot \frac{x}{x+y} \\ &= \frac{(x+y)(x^2-xy+y^2)}{x^2} \cdot \frac{x}{x+y} \\ &= \frac{(x^2-xy+y^2)}{x}\end{aligned}$$

3. Simplify

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

$$\begin{aligned}\frac{a^{-1} + b^{-1}}{a^{-1} - b^{-1}} &= \frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}} \\ &= \frac{(ab)\left(\frac{1}{a} + \frac{1}{b}\right)}{(ab)\left(\frac{1}{a} - \frac{1}{b}\right)} \\ &= \frac{a+b}{b-a}\end{aligned}$$