MATH 0482

Chapter 4.5 Rational Functions: Multiplication and Division

RATIONAL FUNCTION : $R(x) = \frac{P(x)}{Q(x)}$

DOMAIN: x WHERE $Q(x) = 0$

$f(x) = \frac{x^2 - 4x + 3}{x^2 - 5x + 6}$

SIMPLIFY AND STATE RESTRICTIONS.

$f(x) = \frac{24x^7}{6x^5}$

$f(x) = \frac{2x^2 + 5x - 3}{4x^2 - 1}$

$f(x) = \frac{25 - x^2}{x^2 - 10x + 25}$

Simplify.

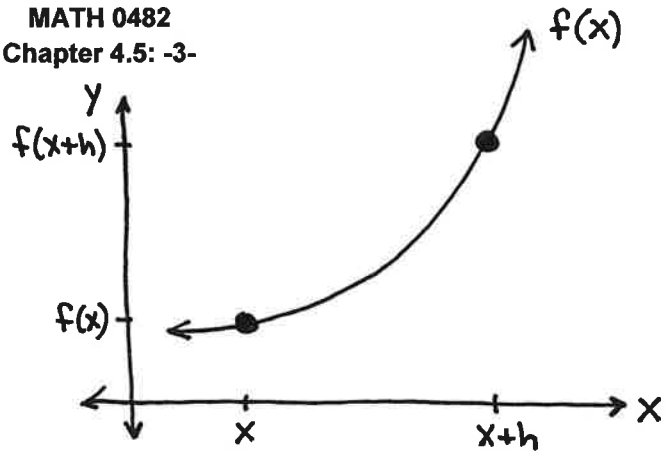
$$\frac{x^3-2x^2y+4xy^2-8y^3}{x^4-16y^4}$$

Simplify.

$$\frac{f(x)-f(3)}{x-3} \text{ if } f(x)=x^2-2x+5$$

DIFFERENCE QUOTIENT

$$\frac{f(x+h)-f(x)}{h} \quad h \neq 0$$



SIMPLIFY $\frac{f(x+h)-f(x)}{h}$ WITH $f(x)=-2x^2+1$.

Multiplying and Dividing Rational Functions

$$\frac{P(x)}{Q(x)} \cdot \frac{R(x)}{S(x)} = \frac{P(x)\cdot R(x)}{Q(x)\cdot S(x)} \qquad \frac{P(x)}{Q(x)} \div \frac{R(x)}{S(x)} = \frac{P(x)}{Q(x)} \cdot \frac{S(x)}{R(x)} = \frac{P(x)\cdot S(x)}{Q(x)\cdot R(x)}$$

→ $f(x) = \frac{9x^2-25}{x-5}$ $g(x) = \frac{x^2-2x-15}{3x+5}$ Find $f(x)\cdot g(x) = (f\cdot g)(x)$ and restrictions.

→ $f(x) = \frac{2x^2+13x-7}{x^2-4x-21}$ $g(x) = \frac{2x^2+5x-3}{49-x^2}$ Find $\left(\frac{f}{g}\right)(x)$ and restrictions.

→ SIMPLIFY AND FIND RESTRICTIONS.

$$\frac{4x^2-1}{6x^2+3x} \div \frac{2x+1}{x^2+2x+1} \cdot \frac{27x^4}{2x^2+x-1}$$