

Review Questions

Write the equation of a function with the following properties:

A hole at $x = 3$ and vertical asymptote at $x = -1$

Vertical asymptotes at $x = \frac{4}{3}$ and $x = -2$

Holes $x = 2$ and $x = 0.5$

a) Restrictions (All restrictions describe either a 'hole' or vertical asymptote)

$$\begin{aligned} x-3 &\neq 0 \\ x &\neq 3 \end{aligned}$$

$$\begin{aligned} x+1 &\neq 0 \\ x &\neq -1 \end{aligned}$$

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

multiple answers!

b) Restrictions

$$\begin{aligned} 3x-4 &\neq 0 \\ 3x &\neq 4 \\ x &\neq \frac{4}{3} \end{aligned}$$

$$x - \frac{4}{3} \neq 0$$

$$3x - 4 \neq 0$$

$$\begin{aligned} x+2 &\neq 0 \\ x &\neq -2 \end{aligned}$$

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

multiple answers!

c) Restrictions

$$\begin{aligned} x-2 &\neq 0 \\ x &\neq 2 \end{aligned}$$

$$y = \frac{(x-2)(2x-1)}{(x-2)(2x-1)}$$

$$2x-1 \neq 0$$

$$2x \neq 1$$

$$x - \frac{1}{2} \neq 0$$

$$x \neq \frac{1}{2}$$

$$x \neq 0.5$$

$$2x - 1 \neq 0$$

multiple answers!

Find two rational expressions (A and B)

such that $A + B = \frac{5x}{(x+1)(x-2)}$

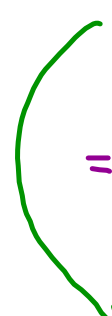
$$\frac{2x}{(x+1)(x-2)} + \frac{3x}{(x+1)(x-2)} = \frac{5x}{(x+1)(x-2)}$$

MULTIPLE ANSWERS!

$$\therefore A = \frac{2x}{(x+1)(x-2)} \quad \text{and} \quad B = \frac{3x}{(x+1)(x-2)}$$

Quiz Take-up

$$\begin{aligned} e) \quad & -2\frac{3}{4} + 3\frac{1}{2} \div \frac{5}{8} \\ & = -\frac{11}{4} + \frac{7}{2} \times \frac{8}{5} \\ & = -\frac{11}{4} + \frac{56}{10} \\ & = -\frac{11}{4} + \frac{28}{5} \\ & = -\frac{55}{20} + \frac{112}{20} \\ & = \underline{\underline{\frac{57}{20}}} \end{aligned}$$

$$\begin{aligned} & \frac{\cancel{3}w^4}{\cancel{2}q^3} \times \frac{\cancel{10}q^4}{\cancel{9}w^6w^2} \\ & = \frac{30w^4q^4}{18q^3w^6} \\ & = \frac{5q}{3w^2}, q, w \neq 0 \end{aligned}$$


$$\frac{x^2 + x - 6}{x^2 + 2x - 15} \times \frac{x + 5}{x + 3}$$

$$= \frac{\cancel{(x+5)}(x-2)\cancel{(x+5)}}{\cancel{(x+5)}(x-3)\cancel{(x+3)}}$$

$$= \frac{x-2}{x-3}, \quad x \neq -5, \pm 3$$

$$\frac{x^2 - 5x + 6}{x^2 + 5x + 4} \div \frac{x^2 - 8x + 15}{x^2 - x - 20}$$

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

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

$$= \frac{x-2}{x+1}, \quad x \neq -4, -1, 3, 5$$

$$\frac{2x-1}{2x^2+3x+1} - \frac{2x+1}{3x^2+4x+1}$$

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

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

$$= \frac{6x^2 - 3x + 2x - 1 - (4x^2 + 2x + 2x + 1)}{(2x+1)(x+1)(3x+1)}$$

$$= \frac{2x^2 - 5x - 2}{(2x+1)(x+1)(3x+1)}, \quad x \neq -1, -\frac{1}{2}, -\frac{1}{3}$$