

A3 Fractional Expressions

Review Domain of an Algebraic Expressions

Review Reducing Rational Expressions

Review Operations with Rational Expressions

Review Compound Rational Expressions

pg.860

Questions: 14, 15, 21, 24, 37, 40, 50, 51, 62, 66

Question 14

$$\frac{x^2 - 2}{x^2 - 4}$$

$$x^2 - 4 \neq 0$$

$$(x-2)(x+2) \neq 0$$

$$x-2 \neq 0$$

$$x \neq 2$$

$$x+2 \neq 0$$

$$x \neq -2$$

Domain

$$\mathbb{R} - \{-2, 2\}$$

Domain

$$x \in (-\infty, -2) \cup$$

$$(-2, 2) \cup (2, +\infty)$$



$$\text{Domain } \{x : x \in \mathbb{R} - \{-2\}\}$$

Question 15

$$\frac{x}{x-1}, \quad x \neq 2$$

$$x-1 \neq 0$$

$$x \neq 1 \quad \text{and} \quad x \neq 2 \text{ (given)}$$

$$D: \mathbb{R} - \{1, 2\}$$

Question21

$$x^2$$

Question 24

$$\frac{x-4}{x+5} = \frac{x^2 - x - 12}{?}$$

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

Question 37

$$\frac{z^2 - 3z}{9 - z^2} = \frac{z(z-3)}{\overset{-1}{(3-z)}(3+z)} = \frac{-z}{3+z}$$

$\underline{9 - z^2}$
 $3^2 - z^2$

$$(z-3) = -1(3-z)$$

Question 40

$$\begin{aligned} \frac{y^3 + 4y^2 - 21y}{y^2 - 49} &= \frac{y(y^2 + 4y - 21)}{(y-7)(y+7)} \\ &= \frac{y(\cancel{y+7})(y-3)}{(y-7)(\cancel{y+7})} \\ &= \frac{y(y-3)}{(y-7)} \end{aligned}$$

Question 50

$$\frac{y^3 + 2y^2 + 4y}{y^3 + 2y^2} \cdot \frac{y^2 - 4}{y^2 - 8} = \frac{\cancel{y} (y^2 + 2\cancel{y} + 4)}{y^2 (\cancel{y+2})} \cdot \frac{(y-2) (\cancel{y+2})}{(y-2) (\cancel{y^2 + 2y + 4})}$$
$$= \frac{1}{y} \cdot \frac{(\cancel{y-2})}{\cancel{y-2}} = \frac{1}{y}$$

Question 62

$$\frac{5}{x^2 + x - 6} - \frac{2}{x-2} + \frac{4}{x^2 - 4}$$

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

$$\frac{5x+10 - 2(x^2 + 5x+6) + 4x+12}{(x+2)(x-2)(x+3)} = \frac{-2x^2 - x + 10}{(x+2)(x-2)(x+3)}$$

See next

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

Question 66

$$\begin{aligned} \frac{2 - \frac{13}{x+5}}{2 + \frac{3}{x-3}} &= \frac{\frac{2(x+5)}{x+5} - \frac{13}{x+5}}{\frac{2(x-3)}{x-3} + \frac{3}{x-3}} = \frac{\frac{2x+10-13}{x+5}}{\frac{2x-6+3}{x-3}} \\ &= \frac{\cancel{2x-3}}{x+5} \cdot \frac{x-3}{\cancel{2x-3}} = \frac{x-3}{x+5} \end{aligned}$$