

Divide: $\frac{x^2 + 4x + 3}{4x^2 + 12x} \div \frac{x + 1}{3}$

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

$$= \frac{3}{4x}, x \neq 0, -3, -1$$

$\frac{x^3 - 4x}{2} \div \frac{(x^4 - 16)}{1}$

$$\frac{(x-2)\cancel{(x+2)}}{2} \cdot \frac{1}{\cancel{(x^2-4)}\cancel{(x+4)}}$$

$$= \frac{x}{2(x^2+4)}, x \neq 2, -2$$

$\frac{20x^2 + x - 1}{7x^3 + x} \div \frac{4x + 1}{x}$

$$\frac{20x^2 + 5x - 4x - 1}{5x(4x+1) - 1(4x+1)}$$

$$\frac{(4x+1)(5x-1)}{(4x+1)(5x-1)}$$

$$\frac{\cancel{(4x+1)}\cancel{(5x-1)}}{x(7x^2+1)} \cdot \frac{x}{\cancel{4x+1}}$$

$$= \frac{5x-1}{7x^2+1}, x \neq 0, -\frac{1}{4}$$

Time to put our simplifying and factoring skills to the test...

Simplify each of the following, stating any non-permissible values for the variables :

$$\frac{x^2 + 11x + 24}{6x^3 + 18x^2} \cdot \frac{6x^3 + 6x^2}{x^2 + 5x - 24}$$

$$\frac{\cancel{6x^2}(x+3)}{\cancel{6x^2}(x+3)} \cdot \frac{\cancel{6x^2}(x+1)}{\cancel{(x+8)}(x-3)}$$

$$= \frac{x+1}{x-3}, x \neq 0, -3, -8, 3$$

$$\frac{n-7}{6n-12} \cdot \frac{12-6n}{n^2-13n+42} - 1$$

$$\frac{\cancel{n-7}}{6\cancel{(n-2)}} \cdot \frac{\cancel{6}(2-n)}{\cancel{(n-7)}(n-6)}$$

$$= \frac{-1}{n-6}, n \neq 2, 7, 6$$

$$\frac{x^2 - 2x}{x^2 + 6x - 27} \cdot \frac{x^2 + 8x + 16}{x^2 + 2x - 8} \div \frac{x^2 - 16}{x^2 + 5x - 24}$$

$$\frac{x\cancel{(x-2)}}{(x+9)\cancel{(x-3)}} \cdot \frac{\cancel{(x+4)}^2}{\cancel{(x+4)}(x-2)} \cdot \frac{\cancel{(x+8)}(x-3)}{(x-x)\cancel{(x+4)}}$$

$$\frac{x(x+8)}{(x+9)(x-x)}, x \neq -9, 3, -x, 3, x, -8$$

Practice Problems...

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