

Answer on Question #59163 - Math - Algebra

Question

$(x-20 \text{ over } x \text{ squared}-4x)+(x \text{ over } x-4)$

$$\frac{x-20}{x^2-4x} + \frac{x}{x-4}$$

Solution

First method

$$\begin{aligned} \frac{x-20}{x^2-4x} + \frac{x}{x-4} &= \frac{x-20}{x(x-4)} + \frac{x}{x-4} = \frac{1}{x-4} \left(\frac{x-20}{x} + x \right) = \frac{1}{x-4} \cdot \frac{x-20+x^2}{x} = \\ &= \frac{x^2+x-20}{(x-4)x} = \frac{(x-4)(x+5)}{(x-4)x} = \\ &= \frac{x+5}{x} = 1 + \frac{5}{x}, \text{ where } x \neq 0, x \neq 4. \end{aligned}$$

Second method

$$\begin{aligned} \frac{x-20}{x^2-4x} + \frac{x}{x-4} &= \frac{x-20}{x(x-4)} + \frac{x}{x-4} = \frac{1/x-20}{x(x-4)} + \frac{x/x}{x-4} = \frac{x-20}{x(x-4)} + \frac{x^2}{x(x-4)} = \\ &= \frac{x-20+x^2}{x(x-4)} = \frac{x^2+x-20}{x(x-4)} = \\ &= \frac{(x-4)(x+5)}{(x-4)x} = \frac{x+5}{x} = 1 + \frac{5}{x}, \\ &\text{where } x \neq 0, x \neq 4. \end{aligned}$$

Answer: $1 + \frac{5}{x}, x \neq 0, x \neq 4.$