

Quiz #3

SOLUTIONS

This quiz is due Friday September 7 at the beginning of the class.

Question 1 (3 points)

Simplify.

$$\begin{aligned} \frac{3}{x} - \frac{4}{x+2} + \frac{1}{x-1} &= \frac{3(x+2)(x-1) - 4x(x-1) + x(x+2)}{x(x-1)(x+2)} \\ &= \frac{3(x+2)(x-1) - 4x(x-1) + x(x+2)}{x(x-1)(x+2)} \\ &= \frac{3x^2 + 3x - 6 - 4x^2 + 4x + x^2 + 2x}{x(x-1)(x+2)} \\ &= \frac{9x - 6}{x(x-1)(x+2)} \\ &= \frac{3(3x - 2)}{x(x-1)(x+2)} \end{aligned}$$

Question 2 (3 points)

Simplify

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

Question 3 (4 points)

Simplify

$$\begin{aligned} \frac{4x^3(x+1)^{\frac{3}{2}} - 2x^2(x+1)^{\frac{1}{2}}}{x^2 - 1} &= \frac{2x^2(x+1)^{\frac{3}{2}}(2x - (x+1))}{(x-1)(x+1)} \\ &= \frac{2x^2(x-1)}{(x-1)(x+1)^{\frac{5}{2}}} \\ &= \frac{2x^2}{(x+1)^{\frac{5}{2}}} \end{aligned}$$