Solve Rational Equations

Solve the following equations:

a) $\dfrac{3}{x} = \dfrac{8}{x-2}$

b) $\dfrac{4}{3x} + \dfrac{5}{4} = \dfrac{3}{x}$

c) $\dfrac{7}{b+3} + \dfrac{5}{b-3} = \dfrac{10b-2}{b^2-9}$

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Solve the following equations:

a) $\dfrac{3}{x} = \dfrac{8}{x-2}$

Cross Multiply to get

$$3(x-2) = 8x$$
$$3x - 6 = 8x$$
$$-6 = 5x$$
$$x = -\dfrac{6}{5}$$

b) $\dfrac{4}{3x} + \dfrac{5}{4} = \dfrac{3}{x}$

Clearing fractions

$$12x\left(\dfrac{4}{3x} + \dfrac{5}{4}\right) = 12x\left(\dfrac{3}{x}\right)$$
$$16 + 15x = 36$$
$$x = \dfrac{4}{3}$$

c) $\dfrac{7}{b+3} + \dfrac{5}{b-3} = \dfrac{10b-2}{b^2-9}$

$$(b-3)(b+3)\left(\dfrac{7}{b+3} + \dfrac{5}{b-3}\right) = (b-3)(b+3)\left(\dfrac{10b-2}{b^2-9}\right)$$

$$7(b-3) + 5(b+3) = 10b - 2$$

$$2b = 4$$

$$b = 2$$

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