Algebraic Fractions Homework Solutions

6 Simplify each of these. Factorise and cancel where appropriate.

a $\frac{3x}{4} + \frac{x}{4}$ **b** $\frac{3x}{4} - \frac{x}{4}$ **c** $\frac{3x}{4} \times \frac{x}{4}$

d $\frac{3x}{4} \div \frac{x}{4}$ **e** $\frac{3x+1}{2} + \frac{x-2}{5}$ **f** $\frac{3x+1}{2} - \frac{x-2}{5}$

g $\frac{3x+1}{2} \times \frac{x-2}{5}$ **h** $\frac{x^2-9}{10} \times \frac{5}{x-3}$ **i** $\frac{2x+3}{5} \div \frac{6x+9}{10}$

j $\frac{2x^2}{9} - \frac{2y^2}{3}$

a $\frac{3x}{4} + \frac{x}{4} = \frac{3x+x}{4} = \frac{4x}{4} = x$

b $\frac{3x}{4} - \frac{x}{4} = \frac{3x-x}{4} = \frac{2x}{4} = \frac{x}{2}$

c $\frac{3x}{4} \times \frac{x}{4} = \frac{3x^2}{16}$

d $\frac{3x}{4} \div \frac{x}{4} = \frac{3\cancel{x}^{1}}{\cancel{4}_{1}} \times \frac{\cancel{4}^{1}}{\cancel{x}_{1}} = 3$

e $\frac{3x+1}{2} + \frac{x-2}{5} = \frac{5(3x+1)+2(x-2)}{10}$

$= \frac{15x+5+2x-4}{10}$

$= \frac{17x+1}{10}$

f $\frac{3x+1}{2} - \frac{x-2}{5}$

$$= \frac{5(3x+1) - 2(x-2)}{10}$$

$$= \frac{15x + 5 - 2x + 4}{10}$$

$$= \frac{13x + 9}{10}$$

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g $\frac{3x+1}{2} \times \frac{x-2}{5}$

$$= \frac{(3x+1)(x-2)}{10}$$

$$= \frac{3x^2 + x - 6x - 2}{10}$$

$$= \frac{3x^2 - 5x - 2}{10}$$

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h $\frac{x^2-9}{10} \times \frac{5}{x-3}$

$$= \frac{(x+3)\cancel{(x-3)}}{\cancel{10}_{2}} \times \frac{\cancel{5}^{1}}{\cancel{(x-3)}_{1}}$$

$$= \frac{x+3}{2}$$

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i $\frac{2x+3}{5} \div \frac{6x+9}{10}$

$$= \frac{2x+3}{5} \times \frac{10}{6x+9}$$

$$= \frac{\cancel{(2x+3)}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{10}^{2}}{3\cancel{(2x+3)}}$$

$$= \frac{2}{3}$$

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i $\frac{2x^2}{9} - \frac{2y^2}{3}$ $= \frac{2x^2 - 3(2y^2)}{9}$

$= \frac{2x^2 - 6y^2}{9}$