Adding Fractions SOLUTIONS

1. i. $\dfrac{5x + 19}{(x + 2)(x + 5)}$

    ii. $\dfrac{14x}{(2x - 1)(3x + 2)}$

    iii. $\dfrac{3x^2 + 1x - 100}{(x + 4)(x - 3)(2)}$

    iv. $\dfrac{24x^2 + 26x + 317}{(4x - 7)(5)(6x + 4)}$

    v. $\dfrac{12 - 9x}{(2 - x)(5 - 3x)}$

2. Express the following as a single fraction.

    (i)

    1 (S*)

    (ii)

    $\dfrac{7x + x^2}{4x + 4}$

    (iii)

    $\dfrac{2x}{x^2 - 1}$

    (iv)

    $\dfrac{6x^2 + 5x + 10}{x^2 + 2x}$

    (v)

    $\dfrac{(x + 1)(x + 3)}{x^2}$ (S*)

    (vi)

    $\dfrac{8x + 1}{(x - 1)(x + 1)}$ (S*)

    (vii)

    $\dfrac{3x - 2}{(x + 3)(x - 2)}$ (S*)

    (viii)

    $\dfrac{x - y}{xy}$ (S*)

    (ix)

    $x - 2$

    (x)

$$\frac{2x^2 + 7x}{4x^2 - 9}$$

3. The following problems reduce to a constant when simplified. Find each constant.
   (i)1
   (ii)2
   (iii)0
   (iv)3

4. Show.

   Question 2 (i)

   $$\frac{x}{x+y} + \frac{y}{x+y}$$
   $$=\frac{x(1) + y(1)}{x+y}$$
   $$=\frac{x+y}{x+y}$$
   $$=1$$

   Question 2 (v)

   $$\frac{3}{x^2} + \frac{4}{x} + 1$$
   $$=\frac{3(1) + 4(x) + 1(x^2)}{x^2}$$
   $$=\frac{3 + 4x + x^2}{x^2}$$
   $$=\frac{(x+1)(x+3)}{x^2}$$

   Question 2 (vi)

   $$\frac{4}{x-1} + \frac{3}{x+1} + \frac{x}{x^2-1}$$
   $$=\frac{4}{x-1} + \frac{3}{x+1} + \frac{x}{(x-1)(x+1)}$$
   $$=\frac{4(x+1) + 3(x-1) + x(1)}{(x-1)(x+1)}$$
   $$=\frac{4x + 4 + 3x - 3 + x}{(x-1)(x+1)}$$
   $$=\frac{8x + 1}{(x-1)(x+1)}$$

Question 2 (vii)

$$\frac{5x-6}{x^2+x-6} - \frac{2}{x+3}$$
$$= \frac{5x-6}{(x+3)(x-2)} - \frac{2}{x+3}$$
$$= \frac{(5x-6)(1) - 2(x-2)}{(x+3)(x-2)}$$
$$= \frac{5x-6-2x+4}{(x+3)(x-2)}$$
$$= \frac{3x-2}{(x+3)(x-2)}$$

Question 2 (viii)

$$\frac{x}{y^2+xy} - \frac{y}{x^2+xy}$$
$$= \frac{x}{y(y+x)} - \frac{y}{x(x+y)}$$
$$= \frac{x(x) - y(y)}{(x)(y)(x+y)}$$
$$= \frac{x^2 - y^2}{(x)(y)(x+y)}$$
$$= \frac{(x-y)(x+y)}{(x)(y)(x+y)}$$
$$= \frac{x-y}{xy}$$