

EXERCISE 9.3

Solve the following equations and verify your answer:

1. $(2x-3) / (3x+2) = -2/3$

Solution:

We have,

$$(2x-3) / (3x+2) = -2/3$$

Let us perform cross-multiplication we get,

$$3(2x - 3) = -2(3x + 2)$$

$$6x - 9 = -6x - 4$$

When rearranged,

$$6x + 6x = 9 - 4$$

$$12x = 5$$

$$x = 5/12$$

Now let us verify the given equation,

$$(2x-3) / (3x+2) = -2/3$$

By substituting the value of 'x' we get,

$$(2(5/12) - 3) / (3(5/12) + 2) = -2/3$$

$$((5/6)-3) / ((5/4) + 2) = -2/3$$

$$((5-18)/6) / ((5+8)/4) = -2/3$$

$$(-13/6) / (13/4) = -2/3$$

$$(-13/6) \times (4/13) = -2/3$$

$$-4/6 = -2/3$$

$$-2/3 = -2/3$$

Hence, the given equation is verified

2. $(2-y) / (y+7) = 3/5$

Solution:

We have,

$$(2-y) / (y+7) = 3/5$$

Let us perform cross-multiplication we get,

$$5(2-y) = 3(y+7)$$

$$10 - 5y = 3y + 21$$

When rearranged,

$$10 - 21 = 3y + 5y$$

$$8y = -11$$

$$y = -11/8$$

Now let us verify the given equation,

$$(2-y) / (y+7) = 3/5$$

By substituting the value of 'x' we get,

$$(2 - (-11/8)) / ((-11/8) + 7) = 3/5$$

$$((16+11)/8) / ((-11+56)/8) = 3/5$$

$$(27/8) / (45/8) = 3/5$$

$$(27/8) \times (8/45) = 3/5$$

$$27/45 = 3/5$$

$$3/5 = 3/5$$

Hence, the given equation is verified

3. $(5x - 7) / (3x) = 2$

Solution:

We have,

$$(5x - 7) / (3x) = 2$$

Let us perform cross-multiplication we get,

$$5x - 7 = 2(3x)$$

$$5x - 7 = 6x$$

$$5x - 6x = 7$$

$$-x = 7$$

$$x = -7$$

Now let us verify the given equation,

$$(5x - 7) / (3x) = 2$$

By substituting the value of 'x' we get,

$$(5(-7) - 7) / (3(-7)) = 2$$

$$(-35 - 7) / -21 = 2$$

$$-42/-21 = 2$$

$$2 = 2$$

Hence, the given equation is verified

4. $(3x+5) / (2x + 7) = 4$

Solution:

We have,

$$(3x+5) / (2x + 7) = 4$$

Let us perform cross-multiplication we get,

$$3x + 5 = 4(2x+7)$$

$$3x + 5 = 8x + 28$$

$$\begin{aligned}3x - 8x &= 28 - 5 \\-5x &= 23 \\x &= -23/5\end{aligned}$$

Now let us verify the given equation,

$$(3x+5) / (2x + 7) = 4$$

By substituting the value of 'x' we get,

$$(3(-23/5) + 5) / (2(-23/5) + 7) = 4$$

$$(-69/5 + 5) / (-46/5 + 7) = 4$$

$$(-69+25)/5 / (-46+35)/5 = 4$$

$$-44/5 / -11/5 = 4$$

$$-44/5 \times 5/-11 = 4$$

$$44/11 = 4$$

$$4 = 4$$

Hence, the given equation is verified

5. $(2y + 5) / (y + 4) = 1$

Solution:

We have,

$$(2y + 5) / (y + 4) = 1$$

Let us perform cross-multiplication we get,

$$2y + 5 = y + 4$$

$$2y - y = 4 - 5$$

$$y = -1$$

Now let us verify the given equation,

$$(2y + 5) / (y + 4) = 1$$

By substituting the value of 'y' we get,

$$(2(-1) + 5) / (-1 + 4) = 1$$

$$(-2+5) / 3 = 1$$

$$3/3 = 1$$

$$1 = 1$$

Hence, the given equation is verified

6. $(2x + 1) / (3x - 2) = 5/9$

Solution:

We have,

$$(2x + 1) / (3x - 2) = 5/9$$

Let us perform cross-multiplication we get,

$$9(2x + 1) = 5(3x - 2)$$

$$18x + 9 = 15x - 10$$

$$18x - 15x = -10 - 9$$

$$3x = -19$$

$$x = -19/3$$

Now let us verify the given equation,

$$(2x + 1) / (3x - 2) = 5/9$$

By substituting the value of 'x' we get,

$$(2(-19/3) + 1) / (3(-19/3) - 2) = 5/9$$

$$(-38/3 + 1) / (-57/3 - 2) = 5/9$$

$$(-38 + 3)/3 / (-57 - 6)/3 = 5/9$$

$$-35/3 / -63/3 = 5/9$$

$$-35/3 \times 3/-63 = 5/9$$

$$-35/-63 = 5/9$$

$$5/9 = 5/9$$

Hence, the given equation is verified

$$7. (1 - 9y) / (19 - 3y) = 5/8$$

Solution:

We have,

$$(1 - 9y) / (19 - 3y) = 5/8$$

Let us perform cross-multiplication we get,

$$8(1 - 9y) = 5(19 - 3y)$$

$$8 - 72y = 95 - 15y$$

$$8 - 95 = 72y - 15y$$

$$57y = -87$$

$$y = -87/57$$

$$= -29/19$$

Now let us verify the given equation,

$$(1 - 9y) / (19 - 3y) = 5/8$$

By substituting the value of 'y' we get,

$$(1 - 9(-29/19)) / (19 - 3(-29/19)) = 5/8$$

$$(19 + 261)/19 / (361 + 87)/19 = 5/8$$

$$280/19 \times 19/448 = 5/8$$

$$280/448 = 5/8$$

$$5/8 = 5/8$$

Hence, the given equation is verified

8. $2x / (3x + 1) = 1$

Solution:

We have,

$$2x / (3x + 1) = 1$$

Let us perform cross-multiplication we get,

$$2x = 1(3x + 1)$$

$$2x = 3x + 1$$

$$2x - 3x = 1$$

$$-x = 1$$

$$x = -1$$

Now let us verify the given equation,

$$2x / (3x + 1) = 1$$

By substituting the value of 'x' we get,

$$2(-1) / (3(-1) + 1) = 1$$

$$-2 / (-3+1) = 1$$

$$-2/-2 = 1$$

$$1 = 1$$

Hence, the given equation is verified

9. $y - (7 - 8y)/9y - (3 + 4y) = 2/3$

Solution:

We have,

$$y - (7 - 8y)/9y - (3 + 4y) = 2/3$$

$$(y - 7 + 8y) / (9y - 3 - 4y) = 2/3$$

$$(-7 + 9y) / (5y - 3) = 2/3$$

Let us perform cross-multiplication we get,

$$3(-7 + 9y) = 2(5y - 3)$$

$$-21 + 27y = 10y - 6$$

$$27y - 10y = 21 - 6$$

$$17y = 15$$

$$y = 15/17$$

Now let us verify the given equation,

$$y - (7 - 8y)/9y - (3 + 4y) = 2/3$$

By substituting the value of 'y' we get,

$$15/17 - (7 - 8(15/17)) / 9(15/17) - (3 + 4(15/17)) = 2/3$$

$$15/17 - (7 - 120/17) / 135/17 - (3 + 60/17) = 2/3$$

$$15/17 - ((119-120)/17) / 135/17 - ((51+60)/17) = 2/3$$

$$15/17 - (-1/17) / 135/17 - (111/17) = 2/23$$

$$((15 + 1)/17) / ((135-111)/17) = 2/3$$

$$16/17 / 24/17 = 2/3$$

$$16/24 = 2/3$$

$$2/3 = 2/3$$

Hence, the given equation is verified

10. $6/2x - (3 - 4x) = 2/3$

Solution:

We have,

$$6/2x - (3 - 4x) = 2/3$$

$$6/(2x - 3 + 4x) = 2/3$$

$$6/(6x - 3) = 2/3$$

Let us perform cross-multiplication we get,

$$3(6) = 2(6x - 3)$$

$$18 = 12x - 6$$

$$12x = 18 + 6$$

$$12x = 24$$

$$x = 24/12$$

$$= 2$$

Now let us verify the given equation,

$$6/2x - (3 - 4x) = 2/3$$

$$6/(6x - 3) = 2/3$$

By substituting the value of 'x' we get,

$$6/(6(2) - 3) = 2/3$$

$$6/(12-3) = 2/3$$

$$6/9 = 2/3$$

$$2/3 = 2/3$$

Hence, the given equation is verified

11. $2/3x - 3/2x = 1/12$

Solution:

We have,

$$2/3x - 3/2x = 1/12$$

By taking LCM for 2 and 3 which is 6

$$4-9/6x = 1/12$$

$$-5/6x = 1/12$$

By cross-multiplying we get,



$$\begin{aligned}12(-5) &= 1(6x) \\ -60 &= 6x \\ x &= -60/6 \\ &= -10\end{aligned}$$

Now let us verify the given equation,

$$2/3x - 3/2x = 1/12$$

By substituting the value of 'x' we get,

$$2/3(-10) - 3/2(-10) = 1/12$$

$$2/-30 - 3/-20 = 1/12$$

$$-4+6/60 = 1/12$$

$$5/60 = 1/12$$

$$1/12 = 1/12$$

Hence, the given equation is verified

$$12. (3x + 5)/(4x + 2) = (3x + 4)/(4x + 7)$$

Solution:

We have,

$$(3x + 5)/(4x + 2) = (3x + 4)/(4x + 7)$$

$$(3x + 5)/(4x + 2) - (3x + 4)/(4x + 7) = 0$$

By taking LCM as $(4x + 2)(4x + 7)$

$$((3x + 5)(4x + 7) - (3x + 4)(4x + 2)) / (4x + 2)(4x + 7) = 0$$

By cross-multiplying we get,

$$(3x + 5)(4x + 7) - (3x + 4)(4x + 2) = 0$$

$$(3x + 5)(4x + 7) - (3x + 4)(4x + 2) = 0$$

$$12x^2 + 21x + 20x + 35 - 12x^2 - 6x - 16x - 8 = 0$$

$$19x + 35 - 8 = 0$$

$$19x = -27$$

$$x = -27/19$$

Now let us verify the given equation,

$$(3x + 5)/(4x + 2) = (3x + 4)/(4x + 7)$$

By substituting the value of 'x' we get,

$$(3(-27/19) + 5) / (4(-27/19) + 2) = (3(-27/19) + 4) / (4(-27/19) + 7)$$

$$(-81/19 + 5) / (-108/19 + 2) = (-81/19 + 4) / (-108/19 + 7)$$

$$((-81+95)/19) / ((-108+38)/19) = ((-81+76)/19) / ((-108+133)/19)$$

$$14/19 / -70/19 = -5/19 / 25/19$$

$$-14/70 = -5/25$$

$$-1/5 = -1/5$$

Hence, the given equation is verified

13. $(7x - 2) / (5x - 1) = (7x + 3)/(5x + 4)$

Solution:

We have,

$$(7x - 2) / (5x - 1) = (7x + 3)/(5x + 4)$$

$$(7x - 2) / (5x - 1) - (7x + 3)/(5x + 4) = 0$$

By taking LCM as $(5x - 1)(5x + 4)$

$$((7x-2)(5x+4) - (7x+3)(5x-1)) / (5x - 1)(5x + 4) = 0$$

By cross-multiplying we get,

$$(7x-2)(5x+4) - (7x+3)(5x-1) = 0$$

Upon simplification,

$$35x^2 + 28x - 10x - 8 - 35x^2 + 7x - 15x + 3 = 0$$

$$10x - 5 = 0$$

$$10x = 5$$

$$x = 5/10$$

$$= 1/2$$

Now let us verify the given equation,

$$(7x - 2) / (5x - 1) = (7x + 3)/(5x + 4)$$

By substituting the value of 'x' we get,

$$(7(1/2) - 2) / (5(1/2) - 1) = (7(1/2) + 3) / (5(1/2) + 4)$$

$$(7/2 - 2) / (5/2 - 1) = (7/2 + 3) / (5/2 + 4)$$

$$((7-4)/2) / ((5-2)/2) = ((7+6)/2) / ((5+8)/2)$$

$$(3/2) / (3/2) = (13/2) / (13/2)$$

$$1 = 1$$

Hence, the given equation is verified

14. $((x+1)/(x+2))^2 = (x+2) / (x + 4)$

Solution:

We have,

$$((x+1)/(x+2))^2 = (x+2) / (x + 4)$$

$$(x+1)^2 / (x+2)^2 - (x+2) / (x + 4) = 0$$

By taking LCM as $(x+2)^2(x+4)$

$$((x+1)^2(x+4) - (x+2)(x+2)^2) / (x+2)^2(x+4) = 0$$

By cross-multiplying we get,

$$(x+1)^2(x+4) - (x+2)(x+2)^2 = 0$$

Let us expand the equation

$$(x^2 + 2x + 1)(x + 4) - (x + 2)(x^2 + 4x + 4) = 0$$

$$\begin{aligned}x^3 + 2x^2 + x + 4x^2 + 8x + 4 - (x^3 + 4x^2 + 4x + 2x^2 + 8x + 8) &= 0 \\x^3 + 2x^2 + x + 4x^2 + 8x + 4 - x^3 - 4x^2 - 4x - 2x^2 - 8x - 8 &= 0 \\-3x - 4 &= 0 \\x &= -4/3\end{aligned}$$

Now let us verify the given equation,

$$((x+1)/(x+2))^2 = (x+2) / (x + 4)$$

By substituting the value of 'x' we get,

$$\begin{aligned}(x+1)^2 / (x+2)^2 &= (x+2) / (x + 4) \\(-4/3 + 1)^2 / (-4/3 + 2)^2 &= (-4/3 + 2) / (-4/3 + 4) \\((-4+3)/3)^2 / ((-4+6)/3)^2 &= ((-4+6)/3) / ((-4+12)/3) \\(-1/3)^2 / (2/3)^2 &= (2/3) / (8/3) \\1/9 / 4/9 &= 2/3 / 8/3 \\1/4 &= 2/8 \\1/4 &= 1/4\end{aligned}$$

Hence, the given equation is verified

15. $((x+1)/(x-4))^2 = (x+8)/(x-2)$

Solution:

We have,

$$\begin{aligned}((x+1)/(x-4))^2 &= (x+8)/(x-2) \\(x+1)^2 / (x-4)^2 - (x+8) / (x-2) &= 0\end{aligned}$$

By taking LCM as $(x-4)^2 (x-2)$

$$((x+1)^2 (x-2) - (x+8) (x-4)^2) / (x-4)^2 (x-2) = 0$$

By cross-multiplying we get,

$$(x+1)^2 (x-2) - (x+8) (x-4)^2 = 0$$

Upon expansion we get,

$$\begin{aligned}(x^2 + 2x + 1) (x-2) - ((x+8) (x^2 - 8x + 16)) &= 0 \\x^3 + 2x^2 + x - 2x^2 - 4x - 2 - (x^3 - 8x^2 + 16x + 8x^2 - 64x + 128) &= 0 \\x^3 + 2x^2 + x - 2x^2 - 4x - 2 - x^3 + 8x^2 - 16x - 8x^2 + 64x - 128 &= 0 \\45x - 130 &= 0 \\x &= 130/45 \\&= 26/9\end{aligned}$$

Now let us verify the given equation,

$$((x+1)/(x-4))^2 = (x+8)/(x-2)$$

$$(x+1)^2 / (x-4)^2 = (x+8) / (x-2)$$

By substituting the value of 'x' we get,

$$(26/9 + 1)^2 / (26/9 - 4)^2 = (26/9 + 8) / (26/9 - 2)$$

$$((26+9)/9)^2 / ((26-36)/9)^2 = ((26+72)/9) / ((26-18)/9)$$

$$(35/9)^2 / (-10/9)^2 = (98/9) / (8/9)$$

$$(35/-10)^2 = (98/8)$$

$$(7/2)^2 = 49/4$$

$$49/4 = 49/4$$

Hence, the given equation is verified

16. $(9x-7)/(3x+5) = (3x-4)/(x+6)$

Solution:

We have,

$$(9x-7)/(3x+5) = (3x-4)/(x+6)$$

$$(9x-7)/(3x+5) - (3x-4)/(x+6) = 0$$

By taking LCM as $(3x+5)(x+6)$

$$((9x-7)(x+6) - (3x-4)(3x+5)) / (3x+5)(x+6) = 0$$

By cross-multiplying we get,

$$(9x-7)(x+6) - (3x-4)(3x+5) = 0$$

Upon expansion we get,

$$9x^2 + 54x - 7x - 42 - (9x^2 + 15x - 12x - 20) = 0$$

$$44x - 22 = 0$$

$$44x = 22$$

$$x = 22/44$$

$$= 2/4$$

$$= 1/2$$

Now let us verify the given equation,

$$(9x-7)/(3x+5) = (3x-4)/(x+6)$$

By substituting the value of 'x' we get,

$$(9(1/2) - 7) / (3(1/2) + 5) = (3(1/2) - 4) / ((1/2) + 6)$$

$$(9/2 - 7) / (3/2 + 5) = (3/2 - 4) / (1/2 + 6)$$

$$((9-14)/2) / ((3+10)/2) = ((3-8)/2) / ((1+12)/2)$$

$$-5/2 / 13/2 = -5/2 / 13/2$$

$$-5/13 = -5/13$$

Hence, the given equation is verified

17. $(x+2)/(x+5) = x/(x+6)$

Solution:

We have,

$$(x+2)/(x+5) = x/(x+6)$$

$$(x+2)/(x+5) - x/(x+6) = 0$$

By taking LCM as $(x+5)(x+6)$
$$\frac{((x+2)(x+6) - x(x+5))}{(x+5)(x+6)} = 0$$
By cross-multiplying we get,
$$(x+2)(x+6) - x(x+5) = 0$$
Upon expansion,
$$x^2 + 8x + 12 - x^2 - 5x = 0$$
$$3x + 12 = 0$$
$$3x = -12$$
$$x = -12/3$$
$$= -4$$

Now let us verify the given equation,
$$\frac{(x+2)}{(x+5)} = \frac{x}{(x+6)}$$
By substituting the value of 'x' we get,
$$\frac{(-4 + 2)}{(-4 + 5)} = \frac{-4}{(-4 + 6)}$$
$$\frac{-2}{1} = \frac{-4}{2}$$
$$-2 = -2$$
Hence, the given equation is verified

18. $\frac{2x - (7-5x)}{9x - (3+4x)} = \frac{7}{6}$

Solution:

We have,

$$\frac{2x - (7-5x)}{9x - (3+4x)} = \frac{7}{6}$$
$$\frac{(2x - 7 + 5x)}{(9x - 3 - 4x)} = \frac{7}{6}$$
$$\frac{(7x - 7)}{(5x - 3)} = \frac{7}{6}$$

By cross-multiplying we get,

$$6(7x - 7) = 7(5x - 3)$$
$$42x - 42 = 35x - 21$$
$$42x - 35x = -21 + 42$$
$$7x = 21$$
$$x = 21/7$$
$$= 3$$

Now let us verify the given equation,
$$\frac{2x - (7-5x)}{9x - (3+4x)} = \frac{7}{6}$$
$$\frac{(7x - 7)}{(5x - 3)} = \frac{7}{6}$$
By substituting the value of 'x' we get,
$$\frac{(7(3) - 7)}{(5(3) - 3)} = \frac{7}{6}$$
$$\frac{(21-7)}{(15-3)} = \frac{7}{6}$$

$$14/12 = 7/6$$

$$7/6 = 7/6$$

Hence, the given equation is verified

$$19. (15(2-x) - 5(x+6)) / (1-3x) = 10$$

Solution:

We have,

$$15(2-x) - 5(x+6) / (1-3x) = 10$$

$$(30-15x) - (5x + 30) / (1-3x) = 10$$

By cross-multiplying we get,

$$(30-15x) - (5x + 30) = 10(1-3x)$$

$$30 - 15x - 5x - 30 = 10 - 30x$$

$$30 - 15x - 5x - 30 + 30x = 10$$

$$10x = 10$$

$$x = 10/10$$

$$= 1$$

Now let us verify the given equation,

$$(15(2-x) - 5(x+6)) / (1-3x) = 10$$

By substituting the value of 'x' we get,

$$(15(2-1) - 5(1+6)) / (1-3) = 10$$

$$(15 - 5(7)) / -2 = 10$$

$$(15-35) / -2 = 10$$

$$-20 / -2 = 10$$

$$10 = 10$$

Hence, the given equation is verified

$$20. (x+3)/(x-3) + (x+2)/(x-2) = 2$$

Solution:

We have,

$$(x+3)/(x-3) + (x+2)/(x-2) = 2$$

By taking LCM as $(x-3)(x-2)$

$$((x+3)(x-2) + (x+2)(x-3)) / (x-3)(x-2) = 2$$

By cross-multiplying we get,

$$(x+3)(x-2) + (x+2)(x-3) = 2((x-3)(x-2))$$

Upon expansion,

$$x^2 + 3x - 2x - 6 + x^2 - 3x + 2x - 6 = 2(x^2 - 3x - 2x + 6)$$

$$2x^2 - 12 = 2x^2 - 10x + 12$$

$$2x^2 - 2x^2 + 10x = 12 + 12$$

$$\begin{aligned}10x &= 24 \\x &= 24/10 \\&= 12/5\end{aligned}$$

Now let us verify the given equation,

$$(x+3)/(x-3) + (x+2)/(x-2) = 2$$

By substituting the value of 'x' we get,

$$(12/5 + 3)/(12/5 - 3) + (12/5 + 2)/(12/5 - 2) = 2$$

$$((12+15)/5)/((12-15)/5) + ((12+10)/5)/((12-10)/5) = 2$$

$$(27/5)/(-3/5) + (22/5)/(2/5) = 2$$

$$-27/3 + 22/2 = 2$$

$$((-27 \times 2) + (22 \times 3))/6 = 2$$

$$(-54 + 66)/6 = 2$$

$$12/6 = 2$$

$$2 = 2$$

Hence, the given equation is verified

21. $((x+2)(2x-3) - 2x^2 + 6)/(x-5) = 2$

Solution:

We have,

$$((x+2)(2x-3) - 2x^2 + 6)/(x-5) = 2$$

By cross-multiplying we get,

$$(x+2)(2x-3) - 2x^2 + 6 = 2(x-5)$$

$$2x^2 - 3x + 4x - 6 - 2x^2 + 6 = 2x - 10$$

$$x = 2x - 10$$

$$x - 2x = -10$$

$$-x = -10$$

$$x = 10$$

Now let us verify the given equation,

$$((x+2)(2x-3) - 2x^2 + 6)/(x-5) = 2$$

By substituting the value of 'x' we get,

$$((10+2)(2(10) - 3) - 2(10)^2 + 6)/(10-5) = 2$$

$$(12(17) - 200 + 6)/5 = 2$$

$$(204 - 194)/5 = 2$$

$$10/5 = 2$$

$$2 = 2$$

Hence, the given equation is verified

22. $(x^2 - (x+1)(x+2))/(5x+1) = 6$

Solution:

We have,

$$(x^2 - (x+1)(x+2))/(5x+1) = 6$$

By cross-multiplying we get,

$$(x^2 - (x+1)(x+2)) = 6(5x+1)$$

$$x^2 - x^2 - 2x - x - 2 = 30x + 6$$

$$-3x - 2 = 30x + 6$$

$$30x + 3x = -2 - 6$$

$$33x = -8$$

$$x = -8/33$$

Now let us verify the given equation,

$$(x^2 - (x+1)(x+2))/(5x+1) = 6$$

By substituting the value of 'x' we get,

$$((-8/33)^2 - ((-8/33)+1)(-8/33 + 2))/(5(-8/33)+1) = 6$$

$$(64/1089 - ((-8+33)/33)((-8+66)/33)) / (-40+33)/33 = 6$$

$$(64/1089 - (25/33)(58/33)) / (-7/33) = 6$$

$$(64/1089 - 1450/1089) / (-7/33) = 6$$

$$((64-1450)/1089) / (-7/33) = 6$$

$$-1386/1089 \times 33/-7 = 6$$

$$1386 \times 33 / 1089 \times -7 = 6$$

$$6 = 6$$

Hence, the given equation is verified

23. $((2x+3) - (5x-7))/(6x+11) = -8/3$

Solution:

We have,

$$((2x+3) - (5x-7))/(6x+11) = -8/3$$

By cross-multiplying we get,

$$3((2x+3) - (5x-7)) = -8(6x+11)$$

$$3(2x + 3 - 5x + 7) = -48x - 88$$

$$3(-3x + 10) = -48x - 88$$

$$-9x + 30 = -48x - 88$$

$$-9x + 48x = -88 - 30$$

$$39x = -118$$

$$x = -118/39$$

Now let us verify the given equation,

$$((2x+3) - (5x-7))/(6x+11) = -8/3$$

By substituting the value of 'x' we get,

$$((2(-118/39) + 3) - (5(-118/39) - 7)) / (6(-118/39) + 11) = -8/3$$

$$((-336/39 + 3) - (-590/39 - 7)) / (-708/39 + 11) = -8/3$$

$$(((-336+117)/39) - ((-590-273)/39)) / ((-708+429)/39) = -8/3$$

$$(-219+863)/39 / (-279)/39 = -8/3$$

$$644/-279 = -8/3$$

$$-8/3 = -8/3$$

Hence, the given equation is verified

24. Find the positive value of x for which the given equation is satisfied:

(i) $(x^2 - 9)/(5+x^2) = -5/9$

Solution:

We have,

$$(x^2 - 9)/(5+x^2) = -5/9$$

By cross-multiplying we get,

$$9(x^2 - 9) = -5(5+x^2)$$

$$9x^2 - 81 = -25 - 5x^2$$

$$9x^2 + 5x^2 = -25 + 81$$

$$14x^2 = 56$$

$$x^2 = 56/14$$

$$x^2 = 4$$

$$x = \sqrt{4}$$

$$= 2$$

(ii) $(y^2 + 4)/(3y^2 + 7) = 1/2$

Solution:

We have,

$$(y^2 + 4)/(3y^2 + 7) = 1/2$$

By cross-multiplying we get,

$$2(y^2 + 4) = 1(3y^2 + 7)$$

$$2y^2 + 8 = 3y^2 + 7$$

$$3y^2 - 2y^2 = 7 - 8$$

$$y^2 = -1$$

$$y = \sqrt{-1}$$

$$= 1$$