Name: _____ Period: _____ Date: _____

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

Solve the system of equation by substitution method.

1. $2x + y = 1$

   $3x - y = 4$

2. $x + y = 2$

   $2x - y = 1$

3. $y = 2x - 3$

   $3x + 2y = 8$

4. $y = 2x + 3$

   $y = 5x - 3$

5. $6a + b = 4$

   $5a + 2b = 1$

6. $2x - 1 = 1$

   $x + 4y + 3 = 0$

7. $2x + y = 7$

   $2x - y = 3$

8. $2(x-y) = 8$

   $x + y = 6$

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Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

Solve the system of equation by elimination method.

9. $7x + 2y = 47$

   $5x - 4y = 1$

10. $3x + 7y = 27$

    $5x + 2y = 16$

11. $3x + 2y = 1$

    $2x - y = 2$

12. $2x + y = 7$

    $2x - y = 3$

13. $2x + y = 1$

    $x + y = 3$

14. $3x + 4y = 25$

    $\frac{x}{3} + \frac{x}{4} = 2$

15. $\frac{x+1}{y+1} = 2$

    $\frac{2x+1}{2y+1} = \frac{1}{3}$

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Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

Solve the system of equation by substitution method.

1. $2x + y = 1$……..(i)

   $3x - y = 4$……..(ii)

   Solving equation (i)
   $y = 1 - 2x$……(iii)
   Substituting the value of y in equation (ii) we get,
   $3x - (1 - 2x) = 4$
   $5x - 1 = 4$
   $5x = 5$
   $x = 1$
   Substituting the value of x in eq. iii.
   $y = 1 - 2(1)$
   $y = -1$

   Solution set: {(x,y)}= {(1,-1)}

2. $x + y = 2$……..(i)

   $2x - y = 1$……(ii)

   Solving equation (i)
   $y = 2 - x$……(iii)
   Substituting the value of y in equation (ii) we get,
   $2x - (2 - x) = 1$
   $2x - 2 + x = 1$
   $3x = 3$
   $x = 1$
   Substituting the value of x in eq. iii.
   $y = 2 - 1$
   $y = 1$

   Solution set: {(x,y)}= {(1,1)}

3. $y = 2x - 3$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

$3x + 2y = 8$

Substituting the value of y from (i) in equation (ii) we get,
$3x + 2(2x - 3) = 8$
$3x + 4x - 6 = 8$
$7x = 14$
$x = 2$
Substituting the value of x in eq. ii.
$3(2) + 2y = 8$
$6 + 2y = 8$
$2y = 2$
$y = 1$
Solution set: {(x,y)}= {(2,1)}

4. $y = 2x + 3$
$y = 5x - 3$

Substituting the value of y from eq (i) to equation (ii) we get,
$2x + 3 = 5x - 3$
$-3x = -6$
$x = 2$
Substituting the value of x in eq. iii.
$y = 5(2) - 3$
$y = 10 - 3$
$y = 7$

Solution set: {(x,y)}= {(2,7)}

5. $6a + b = 4$

$5a + 2b = 1$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

Solving equation (i)

$a=\frac{4-b}{6}$.....(iii)

Substituting the value of y in equation (ii) we get,

$5(\frac{4-b}{6})+2b=1$

$\frac{20-5b}{6}+2b=1$

$\frac{20-5b+12b}{6}=1$

$20-5b+12b=6$

$7b=6-20$

$7b=-14$

$b=-2$

Substituting the value of b in eq. iii.

$5a+2(-2)=1$

$5a-4=1$

$5a=1+4$

$5a=5$

$a=1$

Solution set: {(x,y)}= {(1,-2)}

6. $2x-1=1$.....(i)

$x+4y+3=0$.....(ii)

Solving equation (i)

$2x=2$

$x=1$.....(iii)

Substituting the value of x in equation (ii) we get,

$1+4y+3=0$

$4y=-4$

$y=-1$

Substituting the value of y in eq. ii.

$x+4(-1)+3=0$

$x-1=0$

$x=1$

Solution set: {(x,y)}= {(1,-1)}

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

7. $2x + y = 7$.....(i)

$2x - y = 3$.....(ii)

Solving equation (i)
$y = 7 - 2x$.....(iii)

Substituting the value of y in equation (ii) we get,
$2x - (7 - 2x) = 3$
$2x - 7 + 2x = 3$
$4x = 3 + 7$
$4x = 10$
$x = 5/2$

Substituting the value of x in eq. ii.
$2(5/2) - y = 3$
$y = -3 + 5$
$y = 2$

Solution set: {(x,y)}= {(5/2,2)}

8. 2(x-y)= 8.....(i)

$x + y = 6$.....(ii)

Solving equation (ii)
$y = 6 - x$.....(iii)

Substituting the value of y in equation (i) we get,
2(x-6+x)= 8
2(2x-6)= 8
4x-12= 8
4x= 8 + 12
4x= 20
x= 5

Substituting the value of x in eq. ii.
$5 + y = 6$
$y = 1$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

Solution set: {(x,y)}= {(5,1)}

Solve the system of equation by elimination method.

9. $7x + 2y = 47$……(i)

$5x - 4y = 1$……..(ii)

Multiply equation (i) by 2 then it becomes

$14x + 4y = 94$ ……..(iii)

Now adding eq (ii) and (iii)

$5x - 4y = 1$

$14x + 4y = 94$

$19x \quad = 95$

$x = \frac{95}{19} = 5$

By putting x=5 in eq ii

$5(5) - 4y = 1$

$-4y = 1 - 25$

$4y = 24$

$y = 6$

Solution Set= {(5,6)}

10. $3x + 7y = 27$……(i)

$5x + 2y = 16$……(ii)

Multiply equation (i) by 5 and eq ii by 3 then it becomes

$15x + 35y = 135$ ……..(iii)

$15x + 10y = 48$ ……..(iv)

Now subtracting eq (iv) and (iii)

$15x + 35y = 135$ ……..(iii)

$\pm 15x \pm 10y = \pm 48$ ……..(iv)

$29y = 87$

$y = \frac{87}{29}$

$y = 3$

By putting y=3 in eq i we get:

$3x + 7(3) = 27$

$3x + 21 = 27$

$3x = 27 - 21$

$3x = 6$

$x = 2$

Solution Set= {(2,3)}

11. $3x + 2y = 1$……(i)

$2x - y = 2$……..(ii)

Multiply equation (i) by 2 and eq ii by 3 then it becomes

$6x + 4y = 2$……..(iii)

$6x - 3y = 6$ ……..(iv)

Subtracting adding eq (iv) from (iii)

$6x + 4y = 2$

$\pm 6x \mp 3y = \pm 6$

$7y = -4$

$y = -\frac{4}{7}$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

By putting $y = -\frac{4}{7}$ in eq i we get:

$$3x + 2(-\frac{4}{7}) = 1$$

$$3x - \frac{8}{7} = 1$$

$$3x = 1 + \frac{8}{7}$$

$$3x = \frac{7+8}{7}$$

$$x = \frac{15}{21}$$

$$x = \frac{5}{7}$$

Solution Set= {(2,3)}

12. $2x + y = 7$.....(i)

$2x - y = 3$.....(ii)

Subtracting equations i and ii

$$2x + y = 7$$

$$2x - y = 3$$

$$\pm 2x \mp y = \pm 3$$

$$2y = 4$$

$$y = 2$$

By putting y=2 in eq i we get:

$$2x + 2 = 7$$

$$2x = 5$$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

$x = \frac{5}{2}$

Solution Set= $\{(\frac{5}{2},2)\}$

13. $2x + y = 1$……(ii)

$x + y = 3$……(i)

Subtracting ii from I we get

$2x + y = 1$

$\pm x \pm y = \pm 3$

$x = -2$

Putting $x = -2$ in equation ii we get

$-2 + y = 3$

$y = 5$

Solution Set= $\{(-2,5)\}$

14. $3x + 4y = 25$……(i)

$\frac{x}{3} + \frac{x}{4} = 2$……...(ii)

Rewrite eq ii as:

$4x + 3y = 24$……(iii)

Multiply eq i by 4 and eq iii by 3

$12x + 16y = 100$……(iv)

$12x + 9y = 72$……(v)

Subtracting v from vi

$12x + 16y = 100$

$\pm 12x \pm 9y = \pm 72$

Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

$7y = 28$

$y = 4$

Putting y = 4 in eq i we get:

$3x + 4(4) = 25$

$3x = 25 - 16$

$3x = 9$

$x = 3$

Solution Set= {(3,4)}

15. $\frac{x+1}{y+1} = 2$.....(i)

$\frac{2x+1}{2y+1} = \frac{1}{3}$ ..... (ii)

Simplify eq i and ii

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

$x = 2y + 2 - 1$

$x - 2y = 1$.....(iii)

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

$6x + 3 = 2y + 1$

$6x - 2y = -2$.....(iv)

Substring eq iii from iv we get

$6x - 2y = -2$

$\pm x \mp 2y = \pm 1$

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Solving Systems of Equations Algebraically (Solving Systems of Equations by Substitution and Elimination) Assignment

$$5x = -3$$

$$x = -3/5$$

Substituting $x = -3/5$ in eq iii we get

$$-3/5 - 2y = 1$$

$$-2y = 1 + 3/5$$

$$y = 2/5$$

Solution Set= $\{(-3/5, 2/5)\}$