**RS Aggarwal solutions for class 8 Mathematics chapter 8
Linear equation**

EXERCISE 8A   PAGE NO: 107

Solve:

1. **8x+3=27+2x**
    Solution:
    Given 8x+3=27+2x
    By transposing the above equation we can write as
    8x-2x=27-3
    6x=24
    Again by transposing
    X=24/6=4

2. **5x+7=2x-8**
    Solution:
    Given 5x+7=2x-8,
    By transposing the above equation we can write as
    5x-2x=-7-8
    3x=-15
    Again by transposing
    X=-15/3=-5

3. **2z-1=14-z**
    Solution:
    Given 2z-1=14-z,
    By transposing the above equation we can write as
    2z+z=14+1
    3z=15
    Again by transposing
    z=15/3=5

4. **9x+5=4(x-2)+8**
    Solution:
    Given 9x+5=4(x-2) + 8,
    By transposing the above equation we can write as
    9x+5=4x-8+8
    9x-4x=5
    Again by transposing
    5x=5
    X=5/5=1

5. **(7y)/5=y-4**

   Solution:
   Given (7y)/5=y-4,
   By transposing the above equation we can write as
   7y=5(y-4)
   7y=5y-20
   Again by transposing
   7y-5y=-20
   2y=-20
   Y=-20/2=-10

6. **3x+2/3=2x+1**
   Solution:
   Given 3x+2/3=2x+1
   By transposing the above equation we can write as
   3x+2=3(2x+1)
   3x+2=6x+3
   Again by transposing
   3x-6x=3-2
   -3x=1
   x=-1/3

7. **15(y-4)-2(y-9)+5(y+6)=0**
   Solution:
   Given 15(y-4)-2(y-9) + 5(y+6)=0
   Now by rearranging we get
   15y-60-2y+18+5y+30=0
   18y-12=0
   By transposing the above equation we can write as
   18y=12
   Again by transposing
   Y=12/18
   Y=6/9=2/3

8. **3(5x-7)-2(9x-11)=4(8x-13)-17**
   Solution:
   Given 3(5x-7)-2(9x-11) = 4(8x-13)-17
   Now by rearranging we get
   15x-21-18x+22=32x-52-17
   -3x+1=32x-69

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By transposing the above equation we can write as
35x=70

Again by transposing
x=70/35
x=2

9. **(x-5)/2-(x-3)/5=1/2**
   Solution:
   Given (x-5)/2-(x-3)/5=1/2
   Now by taking L.C.M for 5 and 2 is 10
   (5(x-5)-2(x-3))/10=1/2
   By transposing the above equation we can write as
   (5x-25-2x+6)=10/2
   3x-19=2
   Again by transposing
   3x=19+2=21
   X=21/3=7

10. **(3t-2)/4-(2t+3)/3=2/3-t**
    Solution:
    Given (3t-2)/4-(2t+3)/3=2/3-t
    Now by taking L.C.M for 4 and 3 is 12
    (3(3t-2)-4(2t+3))/12=2/3-t
    By transposing the above equation we can write as
    (9t-6-8t-12)/12=2/3-t
    Again by transposing
    t=26/13
    t=2

11. **(2x+7)/5-(3x+11)/2=(2x+8)/3-5**
    Solution:
    Given (2x+7)/5-(3x+11)/2 = (2x+8)-15
    Now by taking L.C.M for 2 and 5 is 10
    15(2(2x+7)-5(3x+11))/10 = (2x+8)/3-5
    By transposing the above equation we can write as
    33x-20x=123-70
    Again by transposing
    X=-53/53
    x=-1

12. **(5x-4)/6=4x+1-(3x+10)/2**
    Solution:

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Given $(5x-4)/6=4x+1-(3x+10)/2$
Now by taking L.C.M for 1 and 2 is 1
$5x-4-6(4x+1) + 3(3x+10)/6=0$
By cross multiplication we get
$5x-4-6(4x+1) + 3(3x+10) = 0$
$-10x=-20$
Again by transposing,
$X=20/10=2$

13. **5x-(1/3)(x+1)=6(x+(1/30))**
   Solution:
   Given $5x-(1/3) (x+1) = 6(x + (1/30))$
   Taking L.C.M on both sides, we get
   $(15x-(x+1))/3=6(30x+1)/30$
   By cross multiplication,
   $10(14x-1) = 6(30x+1)$
   $140x-180x=6+10$
   $-40x=16$
   $-X=2/5$

14. **4-(2(z-4))/2=1/2(2z+5)**
   Solution:
   Given $4-(2(z-4))/2=1/2(2z+5)$
   Now by taking L.C.M of 1 and 3 is 3
   $12-2(z-4)/3 = (2z+5)/2$
   By cross multiplication we get
   $2(12-2z+8) = 3(2z+5)$
   $40-4z=6z+15$
   $-10z=-25$
   $Z=25/10=5/2$

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EXERCISE 8B   PAGE NO: 111

1. **Two numbers are in the ratio 8:3. If the sum of the numbers is 143, find the numbers.**
   Solution:
   Given two numbers are in the ratio 8:3
   So let the numbers be 8x and 3x
   According to the question we can write as 8x+3x=143
   Which implies 11x=143
   Again by transposing x=143/11
   Therefore x=13
   So the number are 8x=8(13) =104 and 3x=3(3)=39

2. **2/3 of a number is 20 less than the original number. Find the number.**
   Solution:
   Let the original number be x.
   According to the question we can write as (2/3)x+20=x
   On rearranging x-(2/3)x=20
   Now taking the L.C.M of 1 and 3 is 3
   (3x-2x)/3=20
   x/3=20
   Again by transposing x=6o
   So the original number is 60

3. **Four-fifths of a number is 10 more than two-thirds of the number. Find the number.**
   Solution:
   Let the number required is x
   According to the question we can write as
   (4/5) x-10 = (2/3) x
   On rearranging,
   (4/5) x-(2/3) x = 10
   Now taking the L.C.M of 3 and 5 is 15
   (12x-10x)/15=10
   On cross multiplication,
   2x=150
   X=150/2=75
   So the required number is 75

4. **Twenty-four is divided into two parts such that 7 times the first part added to 5 times the second part makes 146. Find each part.**
   Solution:
   Let the two parts of the number be x and (24-x)

According to the question we can write as 7x+5(24-x)=146
7x+120-5x=146
2x=146-120
2x=26
X=26/2
X=13
And also (24-x)=24-13=11
So the parts are 13 and 11

5. **Find the number whose fifth part increased by 5 is equal to its fourth part diminished by 5.**
   Solution:
   Let the number be x.
   According to the question we can write as
   (1/5) x+5 = (1/4) x - 5
   On rearranging
   (1/5) x – (1/4) x = -5-5
   (1/5) x – (1/4)x =-10
   By taking L.C.M we get
   (4x-5x)/20=-10
   Again by transposing
   X= 200

6. **Three numbers are in the ratio of 4:5:6. If the sum of the largest and smallest equals the sum of the third and 55, find the numbers.**
   Solution:
   Let the numbers be 4x, 5x and 6x
   According to the question we can write as
   6x+4x=5x+55
   On rearranging we can write as
   10x – 5x = 55
   5x=55
   X=55/5=11
   So the numbers are 44, 55 and 66

7. **If 10 be added to four times a certain number, the result is 5 less than five times the number. Find the number.**
   Solution:
   Let the number be x.
   According to the question we can write as
   10+4x=5x-5
   On rearranging
   4x-5x=-5-10

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-x=-15
So x=15

8. **Two numbers are such that the ratio between them is 3:5. If each is increased by 10, the ratio between the new numbers so formed is 5:7. Find the original number.**
   Solution:
   Let the numbers be 3x and 5x.
   According to the question we can write as
   (3x+10) / (5x+10) = (5/7)
   On cross multiplying we get
   7(3x+10) = 5(5x+10)
   21x+70=25x+50
   On rearranging or transposing
   70-50=25x-21x
   4x=20
   X=20/4=5
   So the numbers are 15 and 25

9. **Find three consecutive odd numbers whose sum is 147.**
   Solution:
   Let the three consecutive numbers be (2x+1), (2x+3) and (2x+5)
   According to the question we can write as 2x+1+2x+3+2x+5=147
   On simplifying we get 6x+9=147
   On rearranging we get
   6x=147-9
   6x=138
   X=138/6=23
   So the numbers are (2x+1)=47
   (2x+3)=49
   (2x+5)=51

10. **Find the three consecutive even number whose sum is 234.**
    Solution:
    Let the three consecutive numbers be 2x, (2x+2) and (2x+4)
    According to the question we can write as 2x+2x+2+2x+4=234
    On simplifying we get 6x+6=234
    On rearranging we get
    6x=234-6
    6x=228
    X=228/6=38
    So the numbers are (2x) = 76
    (2x+2)=78

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(2x+4)=80

11. **The sum of the digits of a two digit number is 12. If the new number formed by reversing the digits is greater than the original number by 54, find the original number. Check your solution.**
Solution:
Let the digits be x and y, so the number will be = (10x+y), on reversing the digits, the new number will be = (10y+x)
According to the question we can write as x + y=12 and also we can write as 10y+x-10x-y=54
Which implies 9y-9x=54
Y-x=54/9
Y-x=6
Y=6+x
Now on substituting this in x + y=12 we get
X+6+x=12
2x+6=12
2x=12-6
X=6/2=3
Now y=6+x=6+3=9
So the number is 39
To check: digit sum=3+9=12
Reversing the digit numbers becomes 93 and 93-39=54
Hence verified.

12. **The digit in the tens place of a two digit number is three times that in the units place. If the digits are reversed, the new number will be 36 less than the original number. Find the original number.**
Solution:
Let the digits be x and y, so the number will be = (10x+y), on reversing the digits, the new number will be = (10y+x)
According to the question we can write as x =3y and also we can write as 10y+x+36=10x+y
Which implies 10y-y+36=10x-x
9y+36=9x
Now substituting the value of x
9y+36=27y
-18y=-36
Y=2 and x=6
Now y=6+x=6+3=9
So the number is 62
To check: digit sum=6+2=8
Reversing the digit numbers becomes 26 and 26+36=62
Hence verified.

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13. **The denominator of a rational number is greater than its numerator by 7. If the numerator is increased by 17 and the denominator decreased by 6, the new number becomes 2. Find the original number.**

    Solution:
    Let the rational number be x/y
    According to the question we can write as y=x+7
    Which implies x=y-7 and (x+17)/(y-6) = 2
    Now substituting the value of x in above equation we get
    (y-7+17)/(y-6) = 2
    Now by rearranging,
    (y-7+17)=2(y-6)
    Y+10=2y-12
    Y=22
    But x=y-7=22-7=15
    So the number is 15/22

EDUGROSS
WISDOMISING KNOWLEDGE

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EXERCISE 8C   PAGE NO: 113

Select the correct answer in each of the following:

1. If 2x-3=x+2, then x=?
 (a)1   (b) 3   (c)5   (d) 7

 Solution:
  (c)5
 Explanation:
  Given 2x-3=x+2
  By transposing we can write as 2x-x=2+3
  Therefore x=5

2. If 5x+(7/2)=(3/2)x-14, then x=?
 (a)5   (b) -5   (c)6   (d) -6

 Solution:
  (b) -5
 Explanation:
  Given 5x+(7/2)=(3/2)x-14
  On rearranging we get
  5x+(3/2)x=(7/2)-14
  Taking L.C.M we get
  (10x-3x)/2=(-28-7)/2
  7x=-35
  X=-5

3. If z=4/5(z+10), then z=?
 (a) 40   (b) 20   (c) 10   (d) 60

 Solution:
  (a) 40
 Explanation:
  Given z=4/5(z+10)
  By cross multiplying
  z-(4/5)z=40/5
  By taking L.C.M
  z/5 =40/5
  x=40

4. If 3m=5m-(8/5), then m=?

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(a) 2/5   (b) 3/5   (c) 4/5   (d) 1/5

Solution: (c) 4/5
Explanation:
By cross multiplying 5m-3m=8/5
2m=8/5
m=4/5

5. If (5t-3) = 3t-5, then t=?
(a) 1   (b) -1   (c) 2   (d) -2

Solution:
(b) -1
Explanation:
By transposition 5t-3t=-5+3
2t=-2
t=-1

6. If 2y+(5/3)=(26/3)-y, then y=?
(a) 1   (b) 2/3   (c) 6/5   (d) 7/3

Solution:
(d) 7/3
Explanation:
Given 2y+(5/3)=(26/3)-y
On rearranging, 2y+y=(26-5)/3
3y=7
Y=7/3

7. If (6x+1)/3+1=(x=3)/6, then x=?
(a) 1   (b) -1   (c) 3   (d) -3

Solution:
(b) -1
Explanation:
Given (6x+1)/3+1=(x=3)/6,
On rearranging, 12x-x=-3-8
X=-1

8. If n/2-3n/4+5n/6=21, then n=?
(a) 30   (b) 42   (c) 36   (d) 28

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Solution:
(c) 36
Explanation:
Given n/2-3n/4+5n/6=21
On rearranging and taking L.C.M,
(6n_9n+10n)/12=21
7n=21(12)
n=36

9. If (x+1)/(2x+3)=3/8, then x=?
(a) 1/4   (b) 1/3   (c) 1/6   (d)1/2

Solution:
(d) 1/2
Explanation:
Given (x+1)/(2x+3)=3/8,
On rearranging, 8(x+1)=3(2x+3)
8x-6x=9-8
2x=1
X=1/2