Chapter 3. Solving Linear Equations

Ex. 3.5

Answer 1CU.

a) The original equation is $2(g+5)=22$

$\Rightarrow 2g+5=22$ Distributive property

$\Rightarrow 2g+5-5=22-5$ Subtract 5 from each side

$\Rightarrow 2g=17$

$\Rightarrow \frac{2g}{2}=\frac{17}{2}$ Dividing with 2 on both sides

$\Rightarrow g=8.5$

CHECK

$\Rightarrow 2(g+5)=22$ original equation

$\Rightarrow 2(8.5+5)=22$ Substitute 8.5 for g

$\Rightarrow 2(13.5)=22$ Adding

$\Rightarrow 27=22$ Multiplying

Therefore the Solution is not correct.

The error is $2(g+5)\neq 2g+5$

The original equation is $2(g+5)=22$

$\Rightarrow 2g+10=22$ Multiplying and distribute

$\Rightarrow 2g+10-10=22-10$ Substract 10 from each side

$\Rightarrow 2g=12$

$\Rightarrow \frac{2g}{2}=\frac{12}{2}$ Dividing with 2 on both sides

$\Rightarrow g=6$

The Solution is 6.

b) The original equation is $5d = 2d - 18$

$\Rightarrow 5(-6) = 2(-6) - 18$ Substitute -6 for d

$\Rightarrow -30 = -12 - 18$ Multiplying

$\Rightarrow -30 = -30$ Adding

The solution is correct.

c) Step 1:

The original equation is $-6z + 13 = 7z$

$\Rightarrow -6(13) + 13 = 7(13)$ Substitute 13 for z

$\Rightarrow -78 + 13 = 91$ Multiplying

$\Rightarrow -65 = 91$ Adding

The solution is not correct.

The error is adding $-6z$.

Step 2:

$-6z + 13 = 7z$ Original equation

$\Rightarrow -6z + 13 + 6z = 7z + 6z$ Adding 6z on both sides

$\Rightarrow 13 = 13z$ Adding

$\Rightarrow \frac{13}{13} = \frac{13z}{13}$ Dividing with 13 on both sides

$\Rightarrow z = 1$

The solution is 1.

Answer 2CU.

The following steps are to be followed to check whether an equation is an identity.

Step 1: Consider the original equation.

Step 2: Use the distributive property.

Step 3: Verify the reflexive property of equality.

Step 4: If the expressions on each side of the equation are the same this equation is an Identity.

Answer 3CU.

Consider the equation $2m+5=5(m-7)-3m$

$\Rightarrow 2m+5=5(m-7)-3m$ Original equation

$\Rightarrow 2m+5=5m-35-3m$ Distributive property

$\Rightarrow 2m+5=2m-35$ Simplify

$\Rightarrow 2m+5-2m=2m-35-2m$ Subtract 2m from each side

$\Rightarrow 5=-35$ This statement is false.

Since $5=-35$ is a false statement.

This equation has no solution.

Answer 4CU.

The original equation is $6n+7=8n-13$

$\Rightarrow 6n+7-6n=8n-13-6n$ a.Substract 6n on both sides.

$\Rightarrow 7=2n-13$ b.Adding

$\Rightarrow 7+13=2n-13+13$ c.Adding 13 on both sides.

$\Rightarrow 20=2n$ d.Adding

$\Rightarrow \frac{20}{2}=\frac{2n}{2}$ e.Dividing with 2 on both sides.

$\Rightarrow 10=n$ f.Simplify

Answer 5CU.

The original equation is $20c+5=5c+65$.

$\Rightarrow 20c+5-5c=5c+65-5c$ Substract 5c from each side.

$\Rightarrow 15c+5=65$ Adding

$\Rightarrow 15c+5-5=65-5$ Substract 5 from each side.

$\Rightarrow 15c=60$ Simplify

$\Rightarrow \frac{15c}{15}=\frac{60}{15}$ Divide with 15 on each side

CHECK

$20c+5=5c+65$ Original Equation

$\Rightarrow 20(4)+5=5(4)+65$ Substitute 4 for c

$\Rightarrow 80+5=20+65$ Multiply

$\Rightarrow 85=85$ Adding

The solution is 4.

Answer 6CU.

The original equation is $\frac{3}{8}-\frac{1}{4}t=\frac{1}{2}t-\frac{3}{4}$

$\Rightarrow \frac{3}{8}-\frac{1}{4}t+\frac{1}{4}t=\frac{1}{2}+\frac{1}{4}t-\frac{3}{4}$ Adding $\frac{1}{4}t$ on each side.

$\Rightarrow \frac{3}{8}=\frac{3t}{4}-\frac{3}{4}$ Simplify

$\Rightarrow \frac{3}{8}+\frac{3}{4}=\frac{3t}{4}-\frac{3}{4}+\frac{3}{4}$ Adding $\frac{3}{4}$ on each side

$\Rightarrow \frac{9}{8}=\frac{3t}{4}$ Simplify

$\Rightarrow \frac{9(4)}{8}=\frac{3t}{4}\cdot 4$ Multiply with 4 on each side.

$\Rightarrow \frac{36}{8}=3t$ Simplify

$\Rightarrow \frac{36}{8}\cdot\frac{1}{3}=\frac{3t}{3}$ Dividing with 3 on each side.

$\Rightarrow \frac{3}{2}=t$ Simplify

CHECK

$\frac{3}{8}-\frac{1}{4}t=\frac{1}{2}t-\frac{3}{4}$ Original Equation

$\Rightarrow \frac{3}{8}-\frac{1}{4}\left(\frac{3}{2}\right)=\frac{1}{2}\left(\frac{3}{2}\right)-\frac{3}{4}$ Substitute $\frac{3}{2}$ for t

$\Rightarrow \frac{3}{8}-\frac{3}{8}=\frac{3}{4}-\frac{3}{4}$ Multiply and distribute

$\Rightarrow 0=0$

The solution is $\frac{3}{2}$.

Answer 7CU.

The original equation $3(a-5)=-6$

$\Rightarrow 3a-15=-6$ Distribute

$\Rightarrow 3a-15+15=-6+15$ Adding 15 on each side

$\Rightarrow 3a=9$ Simplify

$\Rightarrow \frac{3a}{3}=\frac{9}{3}$ Dividing with 3 on each side

$\Rightarrow a=3$ Simplify

CHECK

$3(a-5)=-6$ Original Equation

$\Rightarrow 3(3-5)=-6$ Substitute 3 for a

$\Rightarrow 3(-2)=-6$ Adding

$\Rightarrow -6=-6$ Multiply

The solution is 3.

Answer 8CU.

The original equation is $7-3r=r-4(2+r)$

$\Rightarrow 7-3r=r-8-4r$ Distribute

$\Rightarrow 7-3r=-8-3r$ Simplify

$\Rightarrow 7-3r+3r=-8-3r+3r$ Adding 3r on each side

$\Rightarrow 7=-8$ This statement is false

This equation has no solution.

Answer 9CU.

The original equation is $6=3+5(d-2)$

$\Rightarrow 6=3+5d-10$ Distributive property

$\Rightarrow 6=5d-7$ Adding

$\Rightarrow 6+7=5d-7+7$ Adding 7 on each side

$\Rightarrow 13=5d$ Adding

$\Rightarrow \frac{13}{5}=\frac{5d}{5}$ Dividing with 5 on each side

$\Rightarrow d=\frac{13}{5}$ Simplify

CHECK

$6=3+5(d-2)$ Original Equation

$\Rightarrow 6=3+5\left(\frac{13}{5}-2\right)$ Substitute $\frac{13}{5}$ for d

$\Rightarrow 6=3+5\left(\frac{13}{5}\right)-10$ Distributive Property

$\Rightarrow 6=3+13-10$ Multiply

$\Rightarrow 6=16-10$ Simplify

$\Rightarrow 6=6$ Simplify

The solution is $\frac{13}{5}$.

Answer 10CU.

The original equation is $\frac{c+1}{8}=\frac{c}{4}$

$\Rightarrow\left(\frac{c+1}{8}\right)=\frac{c}{4}\cdot 8$ Multiply with 8 on each side

$\Rightarrow c+1=2c$ Multiply

$\Rightarrow c+1-c=2c-c$ Substract c on both sides

$\Rightarrow 1=c$ Simplify

CHECK

$\frac{c+1}{8}=\frac{c}{4}$ Original Equation

$\Rightarrow\frac{1+1}{8}=\frac{1}{4}$ Substitute 1 for c

$\Rightarrow\frac{2}{8}=\frac{1}{4}$ Adding

$\Rightarrow\frac{1}{4}=\frac{1}{4}$

Therefore the Solution is 1.

Answer 11CU.

The original equation is $5h-7=5(h-2)+3$

$\Rightarrow 5h-7=5h-10+3$ Distributive property

$\Rightarrow 5h-7=5h-7$ Adding

$\Rightarrow 5h-7+7=5h-7+7$ Adding 7 on both sides

$\Rightarrow 5h=5h$ Reflexive property of equality

.Since the expressions on each side of the equation are the same this equation is an identity.

The statement $5h-7=5(h-2)+3$ is true for all values of h.

Answer 12CU.

The original equation is $5.4w+8.2=9.8w-2.8$

$\Rightarrow 5.4w+8.2-5.4w=9.8w-2.8-5.4w$ Subtract 5.4w on each side

$\Rightarrow 8.2=4.4w-2.8$ Adding

$\Rightarrow 8.2+2.8=4.4w-2.8+2.8$ Adding 2.8 on each side

$\Rightarrow 11.0=4.4w$ Simplify

$\Rightarrow \frac{11.0}{4.4}=\frac{4.4w}{4.4}$ Dividing with 4.4 on each side

$\Rightarrow 2.5=w$ Simplify

CHECK

$5.4w+8.2=9.8w-2.8$ Original Equation

$\Rightarrow 5.4(2.5)+8.2=9.8(2.5)-2.8$ Substitute 2.5 for w

$\Rightarrow 13.5+8.2=24.5-2.8$ Multiply

$\Rightarrow 21.7=21.7$

Therefore the solution is 2.5.

Answer 13CU.

The equation is $75-9t=5(-4+2t)$

$\Rightarrow 75-9t=-20+10t$ Distributive property

$\Rightarrow 75-9t+9t=-20+10t+9t$ Adding 9t on each side

$\Rightarrow 75=-20+19t$ Simplify

$\Rightarrow 75+20=-20+19t+20$ Adding 20 on each side

$\Rightarrow 95=19t$ Simplify

$\Rightarrow \frac{95}{19}=\frac{19t}{19}$ Dividing with 19 on each side

$\Rightarrow 5=t$ Simplify

Therefore the solution is 0.

Answer 14PA.

The given equation is $\frac{3m-2}{5}=\frac{7}{10}$

$\Rightarrow \frac{3m-2}{5}(10)=\frac{7}{10}(10)$ Multiply with 10 on each side

$\Rightarrow (3m-2)2=7$ Simplify

$\Rightarrow 6m-4=7$ Distributive Property

$\Rightarrow 6m-4+4=7+4$ Adding 4 on each side

$\Rightarrow 6m=11$ Adding

$\Rightarrow \frac{6m}{6}=\frac{11}{6}$ Divide with 6 on each side

$\Rightarrow m=1\frac{5}{6}$ Simplify

Answer 15PA.

The given equation is $v+9=7v+9$

$\Rightarrow v+9-v=7v+9-v$ Subtract von each side

$\Rightarrow 9=6v+9$ Simplify

$\Rightarrow 9-9=6v+9-9$ Subtract 9 on each side

$\Rightarrow 0=6v$ Simplify

$\Rightarrow \frac{0}{6}=\frac{6v}{6}$ Divide with 6 on each side

$\Rightarrow 0=v$ Simplify

Answer 16PA.

The given equation is $3-4q=10q+10$

$\Rightarrow 3-4q+4q=10q+10+4q$ Adding 4q on each sides

$\Rightarrow 3=14q+10$ Adding

$\Rightarrow 3-10=14q+10-10$ Subtract 10 on each side

$\Rightarrow -7=14q$ Adding

$\Rightarrow \frac{-7}{14}=\frac{14q}{14}$ Dividing with 14 on each side.

$\Rightarrow \frac{-1}{2}=q$ Simplify

CHECK

$3-4q=10q+10$ Original Equation

$\Rightarrow 3-4\left(\frac{-1}{2}\right)=10\left(\frac{-1}{2}\right)+10$ Substitute $\frac{-1}{2}$ for q.

$\Rightarrow 3+2=-5+10$ Multiply

$\Rightarrow 5=5$

Therefore the solution is $\frac{-1}{2}$.

Answer 17PA.

The given equation is $3k-5=7k-21$

$\Rightarrow 6k-5+21=7k-21+21$ Adding 21 on each side

$\Rightarrow 3k+16=7k$ Adding

$\Rightarrow 3k+16-3k=7k-3k$ Subtract 3k on each side

$\Rightarrow 16=4k$ Adding

$\Rightarrow \frac{16}{4}=\frac{4k}{4}$ Dividing with 4 on each side

$\Rightarrow 4=k$ Simplify

CHECK

$3k-5=7k-21$ Original Equation

$\Rightarrow 3(4)-5=7(4)-21$ substitute 4 for k

$\Rightarrow 12-5=28-21$ Multiply

$\Rightarrow 7=7$

Therefore the solution is 4.

Answer 18PA.

The given equation is $5t-9=-3t+7$

$\Rightarrow 5t-9+9=-3t+7+9$ Adding 9 on each side

$\Rightarrow 5t=-3t+16$ Adding

$\Rightarrow 5t+3t=-3t+16+3t$ Adding 3t on each side

$\Rightarrow 8t=16$ Adding

$\Rightarrow \frac{8t}{8}=\frac{16}{8}$ Dividing with 8 on each side

$\Rightarrow t=2$ Simplify

CHECK

$5t-9=-3t+7$ Original Equation

$\Rightarrow 5(2)-9=-3(2)+7$ substitute 2 for t

$\Rightarrow 10-9=-6+7$ Multiply

$\Rightarrow 1=1$

Therefore the solution is 2.

Answer 19PA.

The given equation is $8s+9=7s+6$

$\Rightarrow 8s+9-9=7s+6-9$ Subtract 9 on each side

$\Rightarrow 8s=7s-3$ Adding

$\Rightarrow 8s-7s=7s-3-7s$ Subtract 7s on each side

$\Rightarrow 8=-3$ Simplify

CHECK

$8s+9=7s+6$ Original Equation

$\Rightarrow 8(-3)+9=7(-3)+6$ substitute -3 for s

$\Rightarrow -24+9=-21+6$ Multiply

$\Rightarrow -15=-15$

Therefore the solution is -3.

Answer 20PA.

The given equation is $\frac{3}{4}n+16=2-\frac{1}{8}n$

$\Rightarrow \frac{3}{4}n+16+\frac{1}{8}n=2-\frac{1}{8}n+\frac{1}{8}n$ Adding $\frac{1}{8}n$ on each side

$\Rightarrow \frac{7}{8}n+16=2$ Adding

$\Rightarrow \frac{7}{8}n+16-16=2-16$ Subtract 16 on each side

$\Rightarrow \frac{7}{8}n=-14$ Adding

$\Rightarrow \left(\frac{7}{8}\cdot n\right)\cdot 8=-14(8)$ Multiplying with 8 on each side

$\Rightarrow 7n=-112$ Multiply

$\Rightarrow \frac{7n}{7}=\frac{-112}{7}$ Divide with 7 on each side

$\Rightarrow n=-4-16$

CHECK

$\frac{3}{4}n+16=2-\frac{1}{8}n$ Original Equation

$\Rightarrow \frac{3}{4}(-16)+16=2-\frac{1}{8}(-16)$ Substitute -16 for n

$\Rightarrow \frac{-48}{4}+16=4$ Multiply

$\Rightarrow -12+16=4$ Simplify

$\Rightarrow 4=4$

Therefore the solution is -16.

Answer 21PA.

The given equation is $\frac{1}{4}-\frac{2}{3}y=\frac{3}{4}-\frac{1}{3}y$

$\Rightarrow \frac{1}{4}-\frac{2}{3}y+\frac{1}{3}y=\frac{3}{4}-\frac{1}{3}y+\frac{1}{3}y$ Adding $\frac{1}{3}$ y on each side

$\Rightarrow \frac{1}{4}-\frac{1}{3}y=\frac{3}{4}$ Adding

$\Rightarrow -\frac{1}{3}+\frac{1}{4}-\frac{1}{4}y=\frac{3}{4}-\frac{1}{4}$ Subtract $\frac{1}{4}$ on each side

$\Rightarrow \frac{-1}{3}y=\frac{2}{4}$ Adding

$\Rightarrow \left(\frac{-1}{3}n\right)\cdot 3=\frac{x}{4}\cdot 3$ Multiplying with 3 on each side

$\Rightarrow -y=\frac{6}{4}$ Multiply

$\Rightarrow -y=\frac{3}{2}$ Simplify

$\Rightarrow y=\frac{-3}{2}$

CHECK

$\frac{1}{4}-\frac{2}{3}y=\frac{3}{4}-\frac{1}{3}y$ Original Equation

$\Rightarrow \frac{1}{4}-\frac{2}{3}\left(\frac{-3}{2}\right)=\frac{3}{4}-\frac{1}{3}\left(-\frac{3}{2}\right)$ Substitute $-\frac{3}{2}$ for y

$\Rightarrow \frac{1}{4}+\frac{6}{6}=\frac{3}{4}+\frac{3}{6}$ Multiply

$\Rightarrow \frac{1}{4}+1=\frac{3}{4}+\frac{1}{2}$ Simplify

$\Rightarrow \frac{1+4}{4}=\frac{3+2}{4}$ Simplify

$\Rightarrow \frac{5}{4}=\frac{5}{4}$

Therefore the solution is $-\frac{3}{2}$.

Answer 22PA.

The given equation is $8=4(3c+5)$

$\Rightarrow 8=12c+20$ Distrtibutive property

$\Rightarrow 8-20=12c+20-20$ Subtract 20 on each side

$\Rightarrow -12=12c$ Adding

$\Rightarrow \frac{-12}{12}=\frac{12c}{12}$ Dividing with 12 on each side

$\Rightarrow c=-1$ Simplify

CHECK

$8=4(3c+5)$ Original equation

$\Rightarrow 8=4(3(-1)+5)$ Substitute -1 for c

$\Rightarrow 8=4(-3+5)$ Multiply

$\Rightarrow 8=4(2)$ Adding and Multiply

$\Rightarrow 8=8$

Therefore the solution is -1.

Answer 23PA.

The given equation is $7(m-3)=7$

$\Rightarrow 7m-21=7$ Distrtibutive property

$\Rightarrow 7m-21+21=7+21$ Adding 21 on each side

$\Rightarrow 7m=28$ Adding

$\Rightarrow \frac{7m}{7}=\frac{28}{7}$ Dividing with 7 on each side

$\Rightarrow m=4$ Simplify

CHECK

$7(m-3)=7$ Original equation

$\Rightarrow 7(4-3)=7$ Substitute 4 for m

$\Rightarrow 7(1)=7$ Simplify

$\Rightarrow 7=7$

Therefore the solution is 4.

Answer 24PA.

The given equation is $6(r+2)-4=-10$

$\Rightarrow 6r+12-4=-10$ Distributive property

$\Rightarrow 6r+8=-10$ Adding

$\Rightarrow 6r+8-8=-10-8$ Subtract 8 on each side

$\Rightarrow 6r=-18$ Simplify

$\Rightarrow \frac{6r}{6}=\frac{-18}{6}$ Dividing with 6 on each side

$\Rightarrow r=-3$ Simplify

CHECK

$6(r+2)-4=-10$ Original Equation

$\Rightarrow 6(-3+2)-4=-10$ Substitute -3 for r

$\Rightarrow 6(-1)-4=-10$ Adding

$\Rightarrow -6-4=-10$ Multiply

$\Rightarrow -10=-10$

Therefore the solution is -3.

Answer 25PA.

The given equation is $5-\frac{1}{2}(x-6)=4$

$\Rightarrow 5-\frac{x}{2}+\frac{6}{2}=4$ Distributive property

$\Rightarrow 5+3-\frac{x}{2}=4$ Divide and Adding

$\Rightarrow 8-\frac{x}{2}=4$

$\Rightarrow 8-\frac{x}{2}-8=4-8$ Subtract 8 on each side

$\Rightarrow -\frac{x}{2}=-4$ Adding

$\Rightarrow \left(\frac{-x}{2}\right)\cdot 2=(-4)\cdot 2$ Multiply with 2 on each side

$\Rightarrow -x=-8$ Multiply

$\Rightarrow x=8$ Simplify

CHECK

$5-\frac{1}{2}(x-6)=4$ Original Equation

$\Rightarrow 5-\frac{1}{2}(8-6)=4$ Substitute 8 for x.

$\Rightarrow 5-\frac{1}{2}(2)=4$ Simplify

$\Rightarrow 5-1=4$ Multiply

$\Rightarrow 4=4$

Therefore the solution is 8.

Answer 26PA.

The given equation is $4(2a-1)=-10(a-5)$

$\Rightarrow 8a-4=-10a+50$ Distributive property

$\Rightarrow 8a-4+10a=-10a+50+10a$ Adding 10a on each side

$\Rightarrow 18a-4=50$ Adding

$\Rightarrow 18a-4+4=50+4$ Adding 4 on each side

$\Rightarrow 18a=54$ Simplify

$\Rightarrow \frac{18a}{18}=\frac{54}{18}$ Divide with 18 on each side

$\Rightarrow a=3$ Simplify

CHECK

$4(2a-1)=-10(a-5)$ Original Equation

$\Rightarrow 4(2(3)-1)=-10$ Substitute 3 for a

$\Rightarrow 4(6-1)=-10(-2)$ Adding

$\Rightarrow 4(5)=20$ Simplify

$\Rightarrow 20=20$

Therefore the solution is 3.

Answer 27PA.

The given equation is $4(f-2)=4f$

$\Rightarrow 4f-8=4f$ Distributive property

$\Rightarrow 4f-8+8=4f+8$ Adding 8 on each side

$\Rightarrow 4f=4f+8$ Simplify

$\Rightarrow 4f-4f=4f+8-4f$ Subtract 4f on each side

$\Rightarrow 0=8$ This statement is false

This equation has no solution.

Answer 28PA.

The given equation is $3(1+d)-5=3d-2$

$\Rightarrow 3+3d-5=3d-2$ Distributive property

$\Rightarrow 3d-2=3d-2$ Reflexive property of equation

The equation is an identity.

The statement $3(1+d)-5=3d-2$ is true for all values of d.

Answer 29PA.

The given equation is $2(w-3)+5=3(w-1)$

$\Rightarrow 2w-6+5=3w-3$ Distributive property

$\Rightarrow 2w-1=3w-3$ Adding

$\Rightarrow 2w-1+3=3w-3+3$ Adding 3 on each side

$\Rightarrow 2w+2=3w$ Simplify

$\Rightarrow 2w+2-2w=3w-2w$ Subtract 2w on each side

$\Rightarrow 2=w$

CHECK

$2(w-3)+5=3(w-1)$ Original Equation

$\Rightarrow 2(2-3)+5=3(2-1)$ Substitute 2 for w

$\Rightarrow 2(-1)+5=3(1)$ Adding

$\Rightarrow -2+5=3$ Multiply

$\Rightarrow 3=3$

Therefore the solution is 2.

Answer 30PA.

The given equation is $\frac{3}{2}y-y=4+\frac{1}{2}y$

$\Rightarrow y\left(\frac{3}{2}-1\right)=4+\frac{1}{2}y$ Simplify

$\Rightarrow y\left(\frac{1}{2}\right)=4+\frac{1}{2}y$ Substituting

$\Rightarrow \frac{y}{2}=4+\frac{y}{2}$

$\Rightarrow \frac{y}{2}-\frac{y}{2}=4+\frac{y}{2}-\frac{y}{2}$ Subtract $\frac{y}{2}$ on each side

$\Rightarrow 0=4$ This statement is false

Therefore the equation has no solution.

Answer 31PA.

The given equation is $3+\frac{2}{5}b=11+\frac{2}{5}b$

$\Rightarrow 3+\frac{2}{5}b=11-\frac{2}{5}b$

$\Rightarrow 3+\frac{2}{5}b+\frac{2}{5}b=11-\frac{2}{5}b+\frac{2}{5}b$ Adding $\frac{2}{5}b$ on each side

$\Rightarrow 3+\frac{4}{5}b=11$ Simplify

$\Rightarrow \frac{4}{5}b+3-3=11-3$ Subtract 3 on each side

$\Rightarrow \frac{4}{5}b=8$ Adding

$\Rightarrow \left(\frac{4}{5}b\right)\cdot 5=8(5)$ Multiply with 5 on each side

$\Rightarrow 4b=40$ Simplify

$\Rightarrow \frac{4b}{4}=\frac{40}{4}$ Divide with 4 on each side

$\Rightarrow b=10$

CHECK

$3+\frac{2}{5}b=11+\frac{2}{5}b$ Original Equation

$\Rightarrow 3+\frac{2}{5}(10)=11-\frac{2}{5}(10)$ Substitute 10 for b

$\Rightarrow 3+2(2)=11-2(2)$ Simplify

$\Rightarrow 3+4=11-4$ Multiply

$\Rightarrow 7=7$

Therefore the solution is 10

Answer 32PA.

The original equation is $\frac{1}{4}(7+3g)=\frac{-g}{8}$

$\Rightarrow \frac{7}{4}+\frac{3}{4}g=\frac{-g}{8}$ Distributive property

$\Rightarrow \frac{7}{4}+\frac{3}{4}g+\frac{g}{8}=\frac{-g}{8}+\frac{g}{8}$ Adding $\frac{g}{8}$ on each side

$\Rightarrow \frac{7}{4}+\frac{7g}{8}=0$ Simplify

$\Rightarrow \frac{7g}{8}+\frac{7}{4}-\frac{7}{4}=0-\frac{7}{4}$ Subtract $\frac{7}{4}$ on each side

$\Rightarrow \frac{7g}{8}=\frac{-7}{4}$ Adding

$\Rightarrow \frac{7g}{8}(8)=\frac{-7}{4}(8)$ Multiply with 8 on each side

$\Rightarrow 7g=-7(2)$

$\Rightarrow 7g=-14$ Multiply

$\Rightarrow \frac{7g}{7}=\frac{-14}{7}$ Divide with 7 on each side

$\Rightarrow g=-2$ Simplify

CHECK

$\frac{1}{4}(7+3g)=\frac{-g}{8}$ Original Equation

$\Rightarrow \frac{1}{4}(7+3(-2))=-\frac{(-2)}{8}$ Substitute -2 for g

$\Rightarrow \frac{1}{4}(7-6)=\frac{2}{8}$ Simplify

$\Rightarrow \frac{1}{4}(1)=\frac{1}{4}$ Simplify

$\Rightarrow \frac{1}{4}=\frac{1}{4}$

The solution is -2.

Answer 33PA.

The given equation is $28-2.2x=11.6x+262.6$

Answer 35PA.

The given equation is $1.03p-4=-2.15p+8.72$

$\Rightarrow 1.03p-4+2.15p=-2.15p+8.72+2.15p$ Adding 2.15p on each side

$\Rightarrow 3.18p-4=8.72$ Adding

$\Rightarrow 3.18p-4+4=8.72+4$ Adding 4 on each side

$\Rightarrow 3.18p=12.72$ Simplify

$\Rightarrow \frac{3.18p}{3.18}=\frac{12.72}{3.18}$ Divide with 3.18 on each side

$\Rightarrow p=4$ Simplify

CHECK

$1.03p-4=-2.15p+8.72$ Original Equation

$\Rightarrow 1.03(4)-4=-2.15(4)+8.72$ Substitute 4 for p

$\Rightarrow 4.12-4=-8.6+8.72$ Multiply

$\Rightarrow 0.12=0.12$

The solution is 4.

Answer 36PA.

The given equation is $18-3.8t=7.36-1.9t$

$\Rightarrow 18-3.8t+3.8t=7.36-1.9t+3.8t$ Adding 3.8 on each side

$\Rightarrow 18=7.36+1.9t$ Simplify

$\Rightarrow 18-7.36=7.36+1.9t-7.36$ Subtract 7.36 on each side

$\Rightarrow 10.64=1.9t$ Simplify

$\Rightarrow \frac{10.64}{1.9}=\frac{1.9t}{1.9}$ Divide with 1.9 on each side

$\Rightarrow 5.6=t$

CHECK

$18-3.8t=7.36-1.9t$ Original Equation

$\Rightarrow 18-3.8(5.6)=7.36-1.9(5.6)$ Substitute 5.6 for t

$\Rightarrow 18-21.28=7.36-10.64$ Multiply

$\Rightarrow -3.28=-3.28$

The solution is 5.6

Answer 37PA.

The given equation is $13.7v-6.5=-2.3v+8.3$

$\Rightarrow 13.7v-6.5+2.3v=-2.3v+8.3+2.3v$ Adding 2.3v on each side

$\Rightarrow 16v-6.5=8.3$ Simplify

$\Rightarrow 16v-6.5+6.5=8.3+6.5$ Adding 6.5 on each side

$\Rightarrow 16v=14.8$ Simplify

$\Rightarrow \frac{16v}{16}=\frac{14.8}{16}$ Dividing with 16 on each side

$\Rightarrow v=0.925$

CHECK

$13.7v-6.5=-2.3v+8.3$ Original equation

$\Rightarrow 13.7(0.925)-6.5=-2.3(0.925)+8.3$ Substitute 0.925 for v

$\Rightarrow 12.6725-6.5=-2.127578.3$

$\Rightarrow 6.1725=6.1725$

The solution is 0.925

Answer 38PA.

The given equation is $2[s+3(s-1)]=18$

$\Rightarrow 2s+6(s-1)=18$ Distributive property

$\Rightarrow 2s+6s-6=18$ Distributive property

$\Rightarrow 8s-6=18$ Simplify

$\Rightarrow 8s-6+6=18+6$ Adding 6 on each side

$\Rightarrow 8s=24$ Simplify

$\Rightarrow \frac{8s}{8}=\frac{24}{8}$ Divide with 8 on each side

$\Rightarrow s=3$

CHECK

$2[s+3(s-1)]=18$ Original equation

$\Rightarrow 2[3+3(3-1)]=18$ Substitute 3 for s

$\Rightarrow 2[3+3(2)]=18$ Simplify

$\Rightarrow 2[3+6]=18$ Multiply

$\Rightarrow 2[9]=18$ Simplify

$\Rightarrow 18=18$

The solution is 3.

Answer 39PA.

The given equation is $-3(2n-5)=0.5(-12n+30)$

$\Rightarrow -6n+15=-6n+15$ Distributive property

$\Rightarrow -6n+15=-6n+15$ Reflexive property of equality

The equation is an identity

The statement $-3(2n-5)=0.5(-12n+30)$ is true for all values of *r*.

Let *x* be a number.

The data given is $\frac{1}{2}x+16-\frac{1}{2}x=\frac{2}{3}x-4$

$\Rightarrow \frac{1}{2}x+16-\frac{1}{2}x=\frac{2}{3}x-4-\frac{1}{2}x$ Subtract $\frac{1}{2}x$ on each side

$\Rightarrow 16=\frac{1}{6}x-4$ Simplify

$\Rightarrow 16+4=\frac{1}{6}x-4+4$ Adding 4 on each side

$\Rightarrow 20=\frac{1}{6}x$ Simplify

$\Rightarrow 20(6)=\left(\frac{1}{6}x\right).6$ Multiply with 6 on each side

$\Rightarrow 120=x$

The solution is 120.

Answer 41PA.

Let *x* be a number.

The data given is $\frac{1}{2}x+6=\frac{1}{3}x$

$\Rightarrow \frac{1}{2}x+6-\frac{1}{3}x=\frac{1}{3}x-\frac{1}{3}x$ Subtract $\frac{1}{3}x$ on each side

$\Rightarrow \frac{1}{6}x+6=0$ Simplify

$\Rightarrow \frac{1}{6}x+6-6=0-6$ Subtract 6 on each side

$\Rightarrow \frac{1}{6}x=-6$ Simplify

$\Rightarrow \left(\frac{1}{6}x\right).6=-6(6)$ Multiply with 6 on each side

$\Rightarrow x=-36$

The solution is -36.

Answer 42PA.

Let the two consecutive odd integers be $2x-1, 2x+1$

The data given is $2(2x+1)-13=3(2x-1)$

$\Rightarrow 4x+2-13=6x-3$ Distributive property

$\Rightarrow 4x-11=6x-3$ Simplify

$\Rightarrow 4x-11-4x=6x-3-4x$ Subtract $4x$ on each side

$\Rightarrow -11=2x-3$ Simplify

$\Rightarrow -11+3=2x-3+3$ Adding 3 on each side

$\Rightarrow -8=2x$ Simplify

$\Rightarrow \frac{-8}{2}=\frac{2x}{2}$ Dividing with 2 on each side

$\Rightarrow -4=x$

The number is -4.

Answer 43PA.

Let the two consecutive odd integers be $2x, 2x+2, 2x+4$

The data given is $3(2x+4)+38=2(2x)$

$\Rightarrow 6x+12+38=4x$ Distributive property

$\Rightarrow 6x+50=4x$ Simplify

$\Rightarrow 6x+50-4x=4x-4x$ Subtract $4x$ on each side

$\Rightarrow 2x+50=0$ Simplify

$\Rightarrow 2x+50-50=0-50$ Subtract 50 on each side

$\Rightarrow 2x=-50$ Simplify

$\Rightarrow \frac{2x}{2}=\frac{-50}{2}$ Divide with 2 on each side

$\Rightarrow x=-25$ Simplify

The numbers are -50,-48,-46.

Answer 44PA.

Let 'a' be the age in years.

The maximum pulse rate given is $0.8(220-a)$

Given maximum pulse of a person is 152.

$\Rightarrow 0.8(220-a)=152$

$\Rightarrow 176-0.8a=152$ Distributive property and multiply

$\Rightarrow 176-0.8a+0.8a=152+0.8a$ Adding 0.8a on each side

$\Rightarrow 176=152+0.8a$ Simplify

$\Rightarrow 176-152=152+0.8a-152$ Subtract 152 on each side

$\Rightarrow 24=0.8a$

$\Rightarrow \frac{24}{0.8}=\frac{0.8a}{0.8a}$ Dividing with 0.8 on each side

$\Rightarrow 30=a$

The age of a person is 30.

Answer 52PA.

The given equation is $5n+4=7(n+1)-2n$

$\Rightarrow 5n+4=7n+7-2n$ Distributive property

$\Rightarrow 5n+4=5n+7$ Reflexive property of equality

Since the expression on each side of the equation are the same,this equation is an identity.

The statement $5n+4=7(n+1)-2n$ is true for all values of n.

Answer 53MYS.

The given equation is $\frac{2}{9}v-6=14$

$\Rightarrow \frac{2}{9}-6+6=14+6$ Adding 6 on each side

$\Rightarrow \frac{2}{9}v=20$ Simplify

$\Rightarrow \left(\frac{2}{9}v\right).9=20.9$ Multiplying with 9 on each side

$\Rightarrow 2v=180$

$\Rightarrow \frac{2v}{2}=\frac{180}{2}$ Dividing with 2 on each side

$\Rightarrow v=90$

CHECK

$\frac{2}{9}v-6=14$ Original Equation

$\Rightarrow \frac{2}{9}.(90)-6=14$ Substitute 90 for v

$\Rightarrow 2(10)-6=14$ Simplify

$\Rightarrow 20-6=14$ Multiply

$\Rightarrow 14=14$

The solution is 90.

Answer 54MYS.

The given equation is $\frac{x-3}{7}=-2$

$\Rightarrow\left(\frac{x-3}{7}\right)(7)=-2(7)$ Multiplying with 7 on each side

$\Rightarrow x-3=-14$ Multiply

$\Rightarrow x-3+3=-14+3$ Adding 3 on each side

$\Rightarrow x=-11$

CHECK

$\frac{x-3}{7}=-2$ Original Equation

$\Rightarrow\frac{-11-3}{7}=-2$ Substitute -11 for x

$\Rightarrow\frac{-14}{7}=-2$ Simplify

$\Rightarrow -2=-2$ Simplify

The solution is -11.

Answer 55MYS.

The given equation is $5-9w=23$

$\Rightarrow 5-9w-5=23-5$ Subtract 5 on each side

$\Rightarrow -9w=18$

$\Rightarrow\frac{-9w}{9}=\frac{18}{9}$ Dividing with 9 on each side

$\Rightarrow -w=2$ Simplify

$\Rightarrow w=-2$

CHECK

$5-9w=23$ Original Equation

$\Rightarrow 5-9(-2)=23$ Substitute -2 for w

$\Rightarrow 5+18=23$ Multiply

$\Rightarrow 23=23$

The solution is -2.

Answer 56MYS.

The data given is calories burnt by Ebony per minute is $=4.5$

Let *x* represent the number of calories.

The number of calories burns for 'm' minutes is 4.5m

Therefore the number of calories burnt by Ebony for 'm' minutes is $x=4.5m$

Answer 57MYS.

Let '*x*' be the time taken by Ebony to burn 150 calories.

Since number of calories burnt for 'm' minutes is 4.5m

$$\Rightarrow 150=4.5m$$

$$\Rightarrow \frac{405m}{4.5}=\frac{150}{4.5} \qquad \text{Dividing with 4.5 on each side.}$$

$$\Rightarrow m=33\frac{1}{3}$$

The time taken to burn 150 calories by Ebony is $33\frac{1}{3}$ minutes.

Answer 60MYS.

$-10+(-17)=-(|-10|+|-17|)$ Both numbers are negative so the sum is negative

$=-(10+17)$

$=-27$ Simplify

Answer 61MYS.

$-12-(-8)=-(|-12|-|-8|)$ Both numbers are negative so the sum is negative

$=-(12-8)$

$=-4$ Simplify

Answer 62MYS.

$6-14=(|6|-|14|)$

$=(6-14)$

$=-8$ Simplify

Answer 63MYS.

Let x, y be two numbers

From the data given $x+y$ is even.

$Let\ x=3, y=5$

$Now\ x+y=3+5$

$\Rightarrow x+y=8$

$\Rightarrow x+y$ is even

But x is not even.

Answer 65MYS.

Given data is $a=5, b=8, c=7, x=2\ and\ y=1$

The expression is $\dfrac{3a^2}{b+c}$

$\Rightarrow \dfrac{3a^2}{b+c}=\dfrac{3(5)^2}{8+7}$ Substitute 5,8,7 for a,b,c respectively

$\Rightarrow \dfrac{3a^2}{b+c}=\dfrac{3.(25)}{15}$ Multiply and Adding

$\Rightarrow \dfrac{3a^2}{b+c}=\dfrac{75}{15}$ Multiply

$\Rightarrow \dfrac{3a^2}{b+c}=5$ Simplify

Therefore the value of expression $\dfrac{3a^2}{b+c}$ is 5.

Answer 66MYS.

The given expression is $x(a+2b)-y$

$\Rightarrow x(a+2b)-y=2(5+2(8))-1$ Substitute 2,5,8,1 for x,a,b,y respectively

$\Rightarrow x(a+2b)-y=2(5+16)-1$ Multiply

$\Rightarrow x(a+2b)-y=2(21)-1$ Adding

$\Rightarrow x(a+2b)-y=42-1$ Multiply

$\Rightarrow x(a+2b)-y=41$

The value of the expression is $x(a+2b)-y$ is 41.

Answer 67MYS.

The given expression is $5(x+2y)-4a$

$\Rightarrow 5(2+2(1))-4(5)$ Substitute 2,1,5 for x, y, a respectively

$\Rightarrow 5(2+2)-20$ Multiply

$\Rightarrow 5(4)-20$ Simplify

$\Rightarrow 20-20$

$\Rightarrow 0$ Simplify

The value of expression is $5(x+2y)-4a$