Exercise 4.2

Question 1:

Give first the step you will use to separate the variable and then solve the equations:

(a) $x-1=0$ (b) $x+1=0$

(c) $x-1=5$ (d) $x+6=2$

(e) $y-4=-7$ (f) $y-4=4$

(g) $y+4=4$ (h) $y+4=-4$

Answer 1:

(a) $x-1=0$

$\Rightarrow \quad x-1+1=0+1$ [Adding 1 both sides]

$\Rightarrow \quad x=1$

(b) $x+1=0$

$\Rightarrow \quad x+1-1=0-1$ [Subtracting 1 both sides]

$\Rightarrow \quad x=-1$

(c) $x-1=5$

$\Rightarrow \quad x-1+1=5+1$ [Adding 1 both sides]

$\Rightarrow \quad x=6$

(d) $x+6=2$

$\Rightarrow \quad x+6-6=2-6$ [Subtracting 6 both sides]

$\Rightarrow \quad x=-4$

(e) $y-4=-7$

$\Rightarrow \quad y-4+4=-7+4$ [Adding 4 both sides]

$\Rightarrow \quad y=-3$

(f) $y-4=4$

$\Rightarrow \quad y-4+4=4+4$ [Adding 4 both sides]

$\Rightarrow \quad y=8$

(g) $y+4=4$

$\Rightarrow \quad y+4-4=4-4$ [Subtracting 4 both sides]

$\Rightarrow \quad y=0$

(h) $y+4=-4$

$\Rightarrow \quad y+4-4=-4-4$ [Subtracting 4 both sides]

$\Rightarrow \quad y=-8$

Question 2:

Give first the step you will use to separate the variable and then solve the equations

(a) $3l = 42$ (b) $\frac{b}{2} = 6$ (c) $\frac{p}{7} = 4$

(d) $4x = 25$ (e) $8y = 36$ (f) $\frac{z}{3} = \frac{5}{4}$

(g) $\frac{a}{5} = \frac{7}{15}$ (h) $20t = -10$

Answer 2:

(a) $3l = 42$

$\Rightarrow \quad \frac{3l}{3} = \frac{42}{3}$ [Dividing both sides by 3]

$\Rightarrow \quad l = 14$

(b) $\frac{b}{2} = 6$

$\Rightarrow \quad \frac{b}{2} \times 2 = 6 \times 2$ [Multiplying both sides by 2]

$\Rightarrow \quad b = 12$

(c) $\frac{p}{7} = 4$

$\Rightarrow \quad \frac{p}{7} \times 7 = 4 \times 7$ [Multiplying both sides by 7]

$\Rightarrow \quad p = 28$

(d) $4x = 25$

$\Rightarrow \quad \frac{4x}{4} = \frac{25}{4}$ [Dividing both sides by 4]

$\Rightarrow \quad x = \frac{25}{4}$

(e) $8y = 36$

$\Rightarrow \quad \frac{8y}{8} = \frac{36}{8}$ [Dividing both sides by 8]

$\Rightarrow \quad y = \frac{9}{2}$

(f) $\frac{z}{3}=\frac{5}{4}$

$\Rightarrow \quad \frac{z}{3}\times 3=\frac{5}{4}\times 3$ [Multiplying both sides by 3]

$\Rightarrow \quad z=\frac{15}{4}$

(g) $\frac{a}{5}=\frac{7}{15}$

$\Rightarrow \quad \frac{a}{5}\times 5=\frac{7}{15}\times 5$ [Multiplying both sides by 5]

$\Rightarrow \quad a=\frac{7}{3}$

(h) $20t=-10$

$\Rightarrow \quad \frac{20t}{20}=\frac{-10}{20}$ [Dividing both sides by 20]

$\Rightarrow \quad t=\frac{-1}{2}$

Question 3:

Give first the step you will use to separate the variable and then solve the equations

(a) $3n-2=46$ (b) $5m+7=17$

(c) $\frac{20p}{3}=40$ (d) $\frac{3p}{10}=6$

Answer 3:

(a) $3n-2=46$

Step I: $3n-2+2=46+2$

$\Rightarrow \quad 3n=48$ [Adding 2 both sides]

Step II: $\frac{3n}{3}=\frac{48}{3}$

$\Rightarrow \quad n=16$ [Dividing both sides by 3]

(b) $5m+7=17$

Step I: $5m+7-7=17-7$

$\Rightarrow \quad 5m=10$ [Subtracting 7 both sides]

Step II: $\frac{5m}{5}=\frac{10}{5}$

$\Rightarrow \quad m=2$ [Dividing both sides by 5]

(c) $\frac{20p}{3} = 40$

Step I: $\frac{20p}{3} \times 3 = 40 \times 3$

$\Rightarrow \quad 20p = 120$ [Multiplying both sides by 3]

Step II: $\frac{20p}{20} = \frac{120}{20}$

$\Rightarrow \quad p = 6$ [Dividing both sides by 20]

(d) $\frac{3p}{10} = 6$

Step I: $\frac{3p}{10} \times 10 = 6 \times 10$

$\Rightarrow \quad 3p = 60$ [Multiplying both sides by 10]

Step II: $\frac{3p}{3} = \frac{60}{3}$

$\Rightarrow \quad p = 20$ [Dividing both sides by 3]

Question 4:

Solve the following equation:

(a) $10p = 100$ (b) $10p + 10 = 100$ (c) $\frac{p}{4} = 5$

(d) $\frac{-p}{3} = 5$ (e) $\frac{3p}{4} = 6$ (f) $3s = -9$

(g) $3s + 12 = 0$ (h) $3s = 0$ (i) $2q = 6$

(j) $2q - 6 = 0$ (k) $2q + 6 = 0$ (l) $2q + 6 = 12$

Answer 4:

(a) $10p = 100$

$\Rightarrow \quad \frac{10p}{10} = \frac{100}{10}$ [Dividing both sides by 10]

$\Rightarrow \quad p = 10$

(b) $10p + 10 = 100$

$\Rightarrow \quad 10p + 10 - 10 = 100 - 10$ [Subtracting both sides 10]

$\Rightarrow \quad 10p = 90$

$\Rightarrow \quad \frac{10p}{10} = \frac{90}{10}$ [Dividing both sides by 10]

$\Rightarrow \quad p = 9$

(c) $\frac{p}{4} = 5$

$\Rightarrow \quad \frac{p}{4} \times 4 = 5 \times 4$ [Multiplying both sides by 4]

$\Rightarrow \quad p = 20$

(d) $\frac{-p}{3} = 5$

$\Rightarrow \quad \frac{-p}{3} \times (-3) = 5 \times (-3)$ [Multiplying both sides by – 3]

$\Rightarrow \quad p = -15$

(e) $\frac{3p}{4} = 6$

$\Rightarrow \quad \frac{3p}{4} \times 4 = 6 \times 4$ [Multiplying both sides by 4]

$\Rightarrow \quad 3p = 24$

$\Rightarrow \quad \frac{3p}{3} = \frac{24}{3}$ [Dividing both sides by 3]

$\Rightarrow \quad p = 8$

(f) $3s = -9$

$\Rightarrow \quad \frac{3s}{3} = \frac{-9}{3}$ [Dividing both sides by 3]

$\Rightarrow \quad s = -3$

(g) $3s + 12 = 0$

$\Rightarrow \quad 3s + 12 - 12 = 0 - 12$ [Subtracting both sides 10]

$\Rightarrow \quad 3s = -12$

$\Rightarrow \quad \frac{3s}{3} = \frac{-12}{3}$ [Dividing both sides by 3]

$\Rightarrow \quad s = -4$

(h) $3s = 0$

$\Rightarrow \quad \frac{3s}{3} = \frac{0}{3}$ [Dividing both sides by 3]

$\Rightarrow \quad s = 0$

(i) $2q = 6$

$\Rightarrow \quad \frac{2q}{2} = \frac{6}{2}$ [Dividing both sides by 2]

$\Rightarrow \quad q = 3$

(j) $2q - 6 = 0$

$\Rightarrow \quad 2q - 6 + 6 = 0 + 6$ [Adding both sides 6]

$\Rightarrow \quad 2q = 6$

$\Rightarrow \quad \frac{2q}{2} = \frac{6}{2}$ [Dividing both sides by 2]

$\Rightarrow \quad q = 3$

(k) $2q + 6 = 0$

$\Rightarrow \quad 2q + 6 - 6 = 0 - 6$ [Subtracting both sides 6]

$\Rightarrow \quad 2q = -6$

$\Rightarrow \quad \frac{2q}{2} = \frac{-6}{2}$ [Dividing both sides by 2]

$\Rightarrow \quad q = -3$

(l) $2q + 6 = 12$

$\Rightarrow \quad 2q + 6 - 6 = 12 - 6$ [Subtracting both sides 6]

$\Rightarrow \quad 2q = 6$

$\Rightarrow \quad \frac{2q}{2} = \frac{6}{2}$ [Dividing both sides by 2]

$\Rightarrow \quad q = 3$