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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
- (c) x-1=5
- (e) y-4=-7
- (g) y+4=4

- (b) x+1=0
- (d) x+6=2
- (f) y-4=4
- (h) y+4=-4

Answer 1:

- (a) x-1=0 $\Rightarrow x-1+1=0+1$ $\Rightarrow x=1$
- (b) x+1=0 $\Rightarrow x+1-1=0-1$ $\Rightarrow x=-1$
- (c) x-1=5 $\Rightarrow x-1+1=5+1$ $\Rightarrow x=6$
- (d) x+6=2 $\Rightarrow x+6-6=2-6$ $\Rightarrow x=-4$
- (e) y-4=-7 $\Rightarrow y-4+4=-7+4$ $\Rightarrow y=-3$
- (f) y-4=4 $\Rightarrow y-4+4=4+4$ $\Rightarrow y=8$
- (g) y+4=4 $\Rightarrow y+4-4=4-4$ $\Rightarrow y=0$
- (h) y+4=-4 $\Rightarrow y+4-4=-4-4$ $\Rightarrow y=-8$

[Adding 1 both sides]

[Subtracting 1 both sides]

[Adding 1 both sides]

[Subtracting 6 both sides]

[Adding 4 both sides]

[Adding 4 both sides]

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[Subtracting 4 both sides]

[Subtracting 4 both sides]

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 $\Rightarrow \frac{3l}{3} = \frac{42}{3}$

[Dividing both sides by 3]

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

$$\Rightarrow \frac{b}{2} \times 2 = 6 \times 2$$

$$\Rightarrow b = 12$$

[Multiplying both sides by 2]

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

$$\Rightarrow \frac{p}{7} \times 7 = 4 \times 7$$

$$\Rightarrow p = 28$$

[Multiplying both sides by 7]

(d)
$$4x = 25$$

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

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

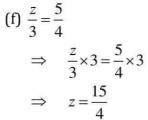
[Dividing both sides by 4]

(e)
$$8y = 36$$

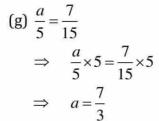
$$\Rightarrow \frac{8y}{8} = \frac{36}{8}$$

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

[Dividing both sides by 8]



[Multiplying both sides by 3]



[Multiplying both sides by 5]

(h)
$$20t = -10$$

$$\Rightarrow \frac{20t}{20} = \frac{-10}{20}$$

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

[Dividing both sides by 20]

Question 3:

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

(a)
$$3n-2=46$$

(b)
$$5m+7=17$$

(b)
$$5m+7=17$$
 (c) $\frac{20p}{3}=40$ (d) $\frac{3p}{10}=6$

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

Answer 3:

(a)
$$3n-2=46$$

$$3n-2+2=46+2$$

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$$\Rightarrow$$
 3n = 48

[Adding 2 both sides]

Step II:
$$\frac{3n}{3} = \frac{48}{3} \implies n = 16$$

[Dividing both sides by 3]

(b)
$$5m+7=17$$

Step I:
$$5m+7-7=17-7 \Rightarrow 5m=10$$
 [Subtracting 7 both sides]

Step II:
$$\frac{5m}{5} = \frac{10}{5} \implies m = 2$$
 [Dividing both sides by 5]

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

Step I:
$$\frac{20p}{3} \times 3 = 40 \times 3 \Rightarrow 20p = 120$$
 [Multiplying both sides by 3]

Step II:
$$\frac{20p}{20} = \frac{120}{20} \Rightarrow p = 6$$
 [Dividing both sides by 20]

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

Step I:
$$\frac{3p}{10} \times 10 = 6 \times 10 \Rightarrow 3p = 60$$
 [Multiplying both sides by 10]

Step II:
$$\frac{3p}{3} = \frac{60}{3} \Rightarrow p = 20$$
 [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)
$$2q+6=0$$

(1)
$$2q+6=12$$

Answer 4:

(a)
$$10p = 100$$

$$\Rightarrow \frac{10p}{10} = \frac{100}{10}$$

$$\Rightarrow p = 10$$

[Dividing both sides by 10]

(b)
$$10p+10=100$$

$$\Rightarrow 10p+10-10=100-10$$

[Subtracting both sides 10]

$$\Rightarrow 10p = 90$$

$$\Rightarrow \frac{10p}{10} = \frac{90}{10}$$
$$\Rightarrow p = 9$$

[Dividing both sides by 10]

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

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

$$\Rightarrow p = 20$$

[Multiplying both sides by 4]

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

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

$$\Rightarrow p = -15$$

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

$$\Rightarrow \frac{3p}{4} \times 4 = 6 \times 4$$

$$\Rightarrow 3p = 24 \Rightarrow \frac{3p}{3} = \frac{24}{3}$$

$$\Rightarrow p = 8$$

(f)
$$3s = -9$$

$$\Rightarrow \frac{3s}{3} = \frac{-9}{3}$$

$$\Rightarrow s = -3$$

(g)
$$3s+12=0$$

 $\Rightarrow 3s+12-12=0-12$

$$\Rightarrow$$
 3s = -12 $\Rightarrow \frac{3s}{3} = \frac{-12}{3}$

$$\Rightarrow s = -4$$

(h)
$$3s = 0$$

$$\Rightarrow \frac{3s}{3} = \frac{0}{3}$$
$$\Rightarrow s = 0$$

(i)
$$2q = 6$$

$$\Rightarrow \frac{2q}{2} = \frac{6}{2}$$

$$\Rightarrow q=3$$

(j)
$$2q-6=0$$

 $\Rightarrow 2q-6+6=0+6$

$$\Rightarrow$$
 $2q=6 \Rightarrow \frac{2q}{2} = \frac{6}{2}$

$$\Rightarrow q=3$$

(k)
$$2q+6=0$$

$$\Rightarrow 2q+6-6=0-6$$

$$\Rightarrow 2q = -6 \Rightarrow \frac{2q}{2} = \frac{-6}{2}$$

$$\Rightarrow q = -3$$

(1)
$$2q+6=12$$

$$\Rightarrow$$
 2q+6-6=12-6

$$\Rightarrow$$
 $2q=6 \Rightarrow \frac{2q}{2} = \frac{6}{2}$

$$\Rightarrow q=3$$

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