

Q1

1a

Start by expanding the bracket on the left-hand side.
Remember to expand both parts of the bracket.

$$\begin{aligned} 3(x - 2) &= x + 7 \\ 3x - 6 &= x + 7 \end{aligned}$$

[]

Bring the x terms to one side by subtracting the term with the smallest coefficient of x (x).

$$\begin{aligned} 3x - 6 &= x + 7 \\ -x & & -x \\ 2x - 6 &= 7 \end{aligned}$$

[]

Add 6 to both sides.

$$2x = 13$$

Divide both sides by 2.

$$x = \frac{13}{2} = 6.5$$

$$\begin{aligned} x &= 6.5 \quad [] \\ \text{Or as a fraction } &\frac{13}{2} \end{aligned}$$

1b

Remove the fraction by multiplying both sides by 5.

$$\begin{aligned} 5\left(\frac{2-y}{5}\right) &= 5(1) \\ 2-y &= 5 \end{aligned}$$

[]

Subtract 2 from both sides.

$$\begin{aligned} -y &= 5 - 2 \\ -y &= 3 \end{aligned}$$

Multiply both sides by -1 to remove the negative sign.

$$y = -3 \quad []$$

Q2

2a

Collect together the 'like terms' (terms with the same letter) by rearranging the expression.
Remember that you must keep the sign in front of the term when you move it.
Be extra careful with the negative term.

$$5x + x + 4y - 7y$$

[]

Add/subtract the like terms to simplify the expression.

$$6x - 3y \quad []$$

2b

Method 1

Start by expanding the bracket.

$$\begin{aligned}7(x + 2) &= 7 \\7x + 14 &= 7\end{aligned}$$

[]

Subtract 14 from both sides.

$$7x = -7$$

Divide both sides by 7.

$$x = -1 \quad []$$

Method 2

Start by dividing both sides by 7.

$$\begin{aligned}7(x + 2) &= 7 \\x + 2 &= 1\end{aligned}$$

[]

Subtract 2 from both sides.

$$x = 1 - 2$$

$$x = -1 \quad []$$

Q3

3a

Substitute $x=3$ into the expression given.

$$4(3)^2$$

Evaluate.

$$4 \times 3^2 = 4 \times 9$$

36 []

3b

Bring the x terms to one side by subtracting the term with the smallest coefficient of $x(x)$.

$$\begin{array}{r}5x + 4 = 14 + x \\-x \qquad \qquad -x \\4x + 4 = 14\end{array}$$

[]

Subtract 4 from both sides.

$$4x = 10$$

Divide both sides by 4.

$$x = \frac{10}{4} = \frac{5}{2} = 2.5$$

 $x = 2.5 \quad []$
Or as a fraction $\frac{5}{2}$ or $\frac{10}{4}$ both accepted.

Q4

4

Start by expanding the bracket on the left-hand side.
Remember to expand both parts of the bracket.

$$\begin{aligned}4(x + 3) &= 2x + 8 \\4x + 12 &= 2x + 8\end{aligned}$$

[]

Bring the x terms to one side by subtracting the term with the smallest coefficient of x ($2x$).

$$\begin{aligned}4x + 12 &= 2x + 8 \\-2x & \qquad \qquad -2x \\2x + 12 &= 8\end{aligned}$$

[]

Subtract 12 from both sides.

$$2x = -4$$

Divide both sides by 2.

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

 $x = -2$ []

Q5

5

Start by expanding the bracket on the right-hand side.
Remember to expand both parts of the bracket.

$$\begin{aligned}5x - 6 &= 3(x - 1) \\5x - 6 &= 3x - 3\end{aligned}$$

[]

Bring the x terms to one side by subtracting the term with the smallest coefficient of x ($3x$).

$$\begin{aligned}5x - 6 &= 3x - 3 \\-3x & \qquad \qquad -3x \\2x - 6 &= -3\end{aligned}$$

[]

Add 6 to both sides.

$$2x = 3$$

Divide both sides by 2.

$$x = \frac{3}{2} = 1.5$$

$x = 1.5$ []
Or as a fraction $\frac{3}{2}$

Q6

6

The second line of Steve's working involved expanding out single brackets.
You must expand **both parts** of the brackets.

$$\begin{aligned}5(x + 2) &= 47 \\5x + 10 &= 47\end{aligned}$$

Steve did not expand the second part of the brackets []

Q7

7

Start by expanding the bracket on the left-hand side.
Remember to expand both parts of the bracket.

$$\begin{aligned}5(4 - x) &= 7 - 3x \\20 - 5x &= 7 - 3x\end{aligned}$$

[]

Bring the x terms to one side by adding the term with the smallest coefficient of x ($-5x$).

$$\begin{array}{r}20 - 5x = 7 - 3x \\+ 5x \qquad \qquad + 5x \\ \hline20 = 7 + 2x\end{array}$$

[]

Subtract 7 from both sides.

$$13 = 2x$$

Divide both sides by 2.

$$\frac{13}{2} = x$$

$$x = \frac{13}{2} \text{ or } 6.5 \quad []$$

It's a good idea to check your answer by using your calculator to substitute it into the original equation, as below

$$x = \frac{13}{2} \text{ or } 6.5 \quad []$$

It's a good idea to check your answer by using your calculator to substitute it into the original equation, as below

$$\begin{aligned}5(4 - 6.5) &= 7 - 3(6.5) \\ \text{LHS: } 5(4 - 6.5) &= -12.5 \\ \text{RHS: } 7 - 3(6.5) &= -12.5\end{aligned}$$

(Left Hand Side matched Right Hand Side therefore correct)

Q8

8

Start by multiplying both sides by 5 to clear the fraction.

$$5y = 2y + 1$$

[]

Bring the y terms to one side by subtracting the term with the smallest coefficient of y ($2y$).

$$\begin{array}{r}5y = 2y + 1 \\- 2y \qquad \qquad - 2y \\ \hline3y = 1\end{array}$$

[]

Divide both sides by 3.

$$y = \frac{1}{3}$$

$$y = \frac{1}{3} \quad []$$

It's a good idea to check your answer by substituting it into the original equation, as below

$$\frac{1}{3} = \frac{2\left(\frac{1}{3}\right) + 1}{5}$$

using calculator, $\frac{2\left(\frac{1}{3}\right) + 1}{5} = \frac{1}{3}$, correct

Q9

9

Bring the x terms to one side by subtracting the term with the smallest coefficient of $x(4x)$.

$$\begin{array}{r} 4x - 13 = 17 + 8x \\ -4x \qquad \qquad -4x \\ \hline -13 = 17 + 4x \end{array}$$

Subtract 17 from both sides.

$$-30 = 4x$$

[]

Divide both sides by 4.

$$x = -7.5 \quad []$$

It's a good idea to check your answer by substituting it into the original equation, and using your calculator to evaluate both sides

$$\begin{array}{l} 4(-7.5) - 13 = 17 + 8(-7.5) \\ \text{LHS: } 4(-7.5) - 13 = -43 \\ \text{RHS: } 17 + 8(-7.5) = -43 \\ \text{Both sides match so the answer is correct} \end{array}$$

Q10

Start by expanding the bracket on the left-hand side.
Remember to expand both parts of the bracket.

$$\begin{array}{l} 5(x + 3) = 3x - 4 \\ 5x + 15 = 3x - 4 \end{array}$$

[]

Bring the x terms to one side by subtracting the term with the smallest coefficient of $x(3x)$.

$$\begin{array}{r} 5x + 15 = 3x - 4 \\ -3x \qquad \qquad -3x \\ \hline 2x + 15 = -4 \end{array}$$

[]

Subtract 15 from both sides.

$$2x = -19$$

Divide both sides by 2.

$$\frac{-19}{2} = x$$

$$x = \frac{-19}{2} \text{ or } -9.5 \quad []$$

It's a good idea to check your answer by using your calculator to substitute it into the original equation, as below

$$\begin{array}{l} 5((-9.5) + 3) = 3(-9.5) - 4 \\ \text{LHS: } 5((-9.5) + 3) = -32.5 \\ \text{RHS: } 3(-9.5) - 4 = -32.5 \end{array}$$

LHS matches RHS therefore answer is correct

Q11

11

Isolate x terms by adding $3x$ to both sides of the equation.

$$\begin{array}{l} 10x + 3x = 62.4 \\ 13x = 62.4 \end{array}$$

[]

Divide both sides of the equation by 13 to find the value of x .

$$x = \frac{62.4}{13} = \frac{24}{5} = 4.8$$

$$x = 4.8 \quad []$$

Fractions equivalent to $\frac{24}{5}$ are also accepted.