Planner

Equations

- Solving equations using inverse operations
- Solving equations involving brackets

Keywords

You should know

explanation 1a explanation 1b

1 Write the inverse of each operation.

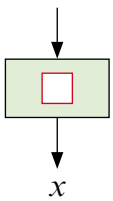
a + 3 **b** × 5 **c** ÷ 2

d − 6 **e** + 7 **f** × 10

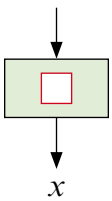
g + 12 **h** ÷ 8 **i** − 9

2 Write down the missing operation in each flowchart. Use inverse operations.

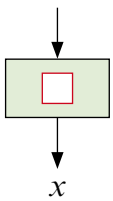
a $x + 8$



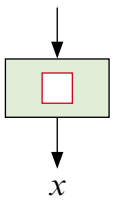
b $x - 9$



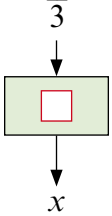
c $2x$



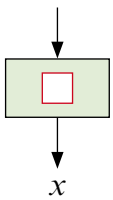
d $x - 5$



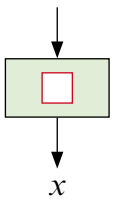
e $\frac{x}{3}$



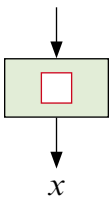
f $3x$



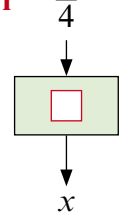
g $x + 5$



h $x - 6$



i $\frac{x}{4}$



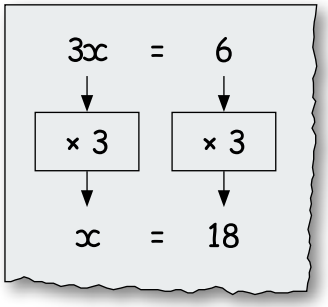
explanation 2a | explanation 2b

3 Tariq's homework was wrong.

His mistake was to multiply both sides of the equation by 3.

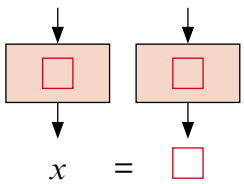
a What operation should he have used?

b Write out the method and answer correctly.

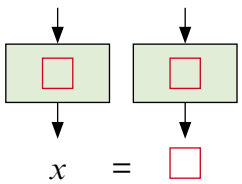


4 Copy and complete these flowcharts.

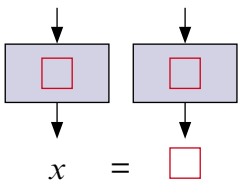
a $x - 2 = 6$



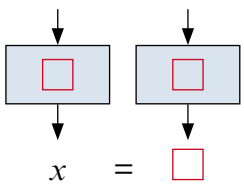
b $\frac{x}{3} = 12$



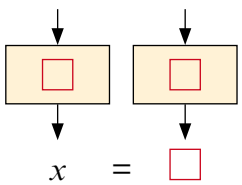
c $x + 7 = 12$



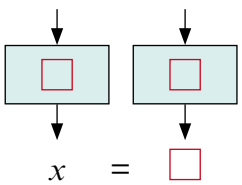
d $5x = 30$



e $\frac{x}{4} = 8$



f $x - 6 = 11$



5 Solve these equations.

a $\frac{x}{6} = 10$ **b** $4j = 32$ **c** $p - 12 = 38$

d $k + 56 = 90$ **e** $\frac{t}{2} = 50$ **f** $2r = 30$

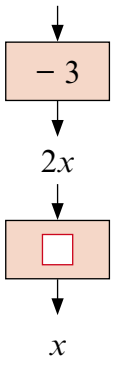
g $x - 24 = 26$ **h** $3y = 24$ **i** $5m = 75$

j $\frac{s}{4} = 12$ **k** $w + 32 = 74$ **l** $\frac{n}{25} = 8$

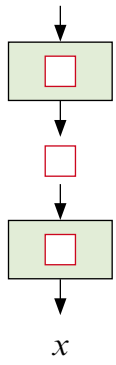
explanation 3

6 Copy and complete these flowcharts. Use inverse operations.

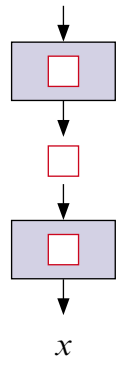
a $2x + 3$



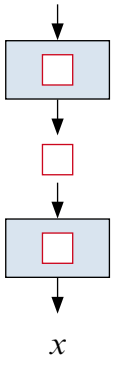
b $3x + 2$



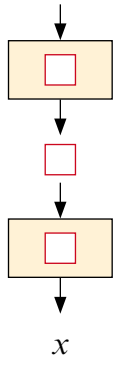
c $5x - 1$



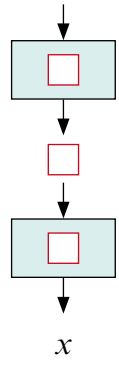
d $4x - 5$



e $2x + 6$



f $7x - 8$



explanation 4 online

7 This equation has been solved correctly.

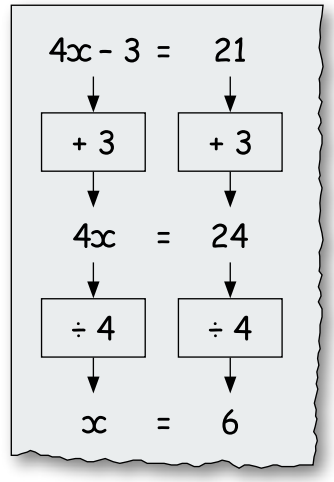
a Why is $4x - 3$ *not* the same as $1x$?

b Why is $4x - 3 + 3$ *not* equal to $4x - 6$?

c Why is the first step to add 3?

d Why is the next step to divide by 4?

e Substitute $x = 6$ into $4x - 3$.
How does this tell you that $x = 6$ is the correct solution to the equation?



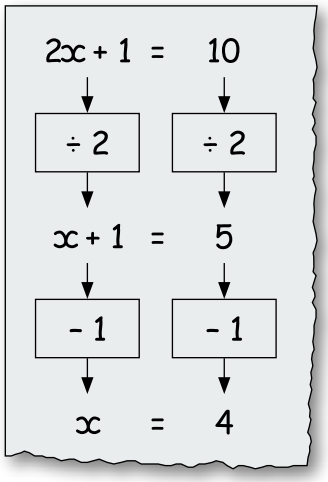
8 This equation has *not* been solved correctly.

a Substitute $x = 4$ into $2x + 1$.
How does this tell you that $x = 4$ is *not* the correct solution to the equation?

b What mistake has been made in the working?

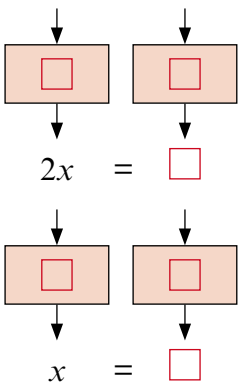
c Write out the correct solution.

d Use substitution to show your answer is correct.

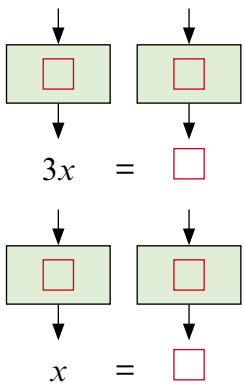


9 Copy and complete the flowcharts to solve these equations.
Use inverse operations. Use substitution to check your answers.

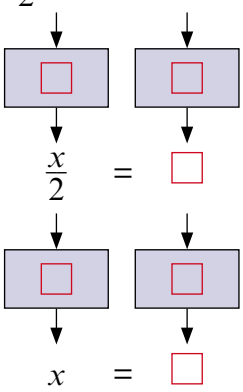
a $2x + 5 = 17$



b $3x + 6 = 15$

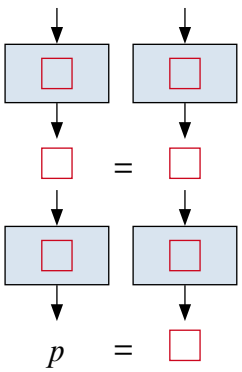


c $\frac{x}{2} - 1 = 11$

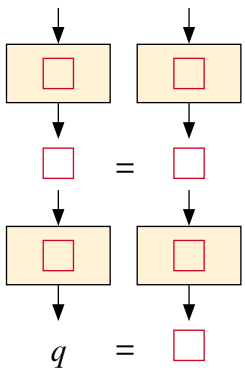


10 Copy and complete the flowcharts to solve these equations.
Use inverse operations. Use substitution to check your answers.

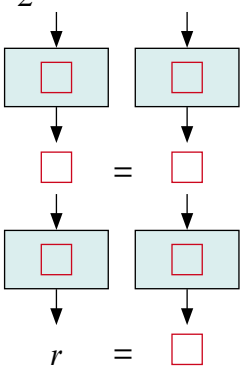
a $5p - 6 = 14$



b $7q + 8 = 29$



c $\frac{r}{2} + 2 = 6$



11 Solve these equations. Use inverse operations.

a $3x - 10 = 26$ **b** $2t + 12 = 30$ **c** $5p - 6 = 34$

d $2w + 18 = 18$ **e** $6r - 10 = 20$ **f** $\frac{t}{2} + 2 = 12$

g $4d - 10 = 18$ **h** $\frac{y}{2} - 2 = 5$ **i** $4e + 5 = 7$

j $\frac{b}{2} - 1 = 8$ **k** $6f + 8 = 26$ **l** $12g - 7 = 41$

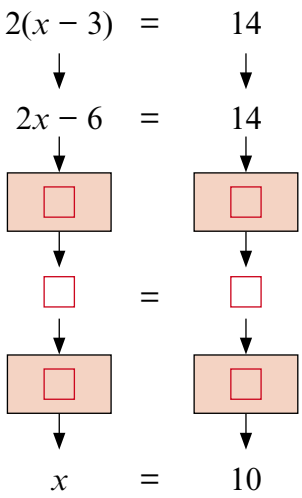
explanation 5 online

***12** This equation involves brackets. $2(x - 3) = 14$

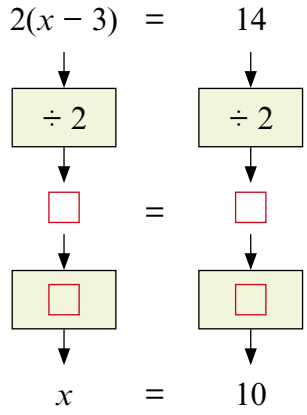
a Substitute $x = 10$ into $2(x - 3)$ to show that $x = 10$ is the correct solution to the equation.

b Why is $2(x - 3)$ the same as $2x - 6$?

c Copy and complete the flowchart.

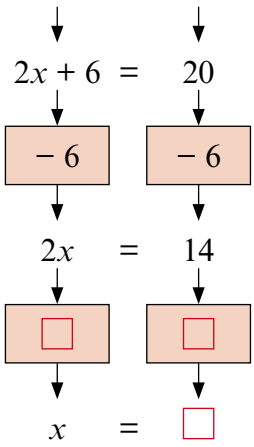


d Copy and complete this flowchart. Start by dividing by 2.

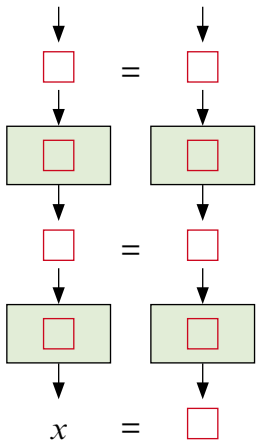


***13** Copy and complete these flowcharts. Start by expanding the brackets. The first one has been started for you.

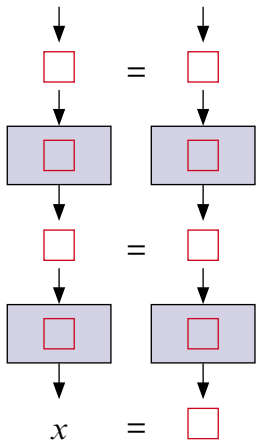
a $2(x + 3) = 20$



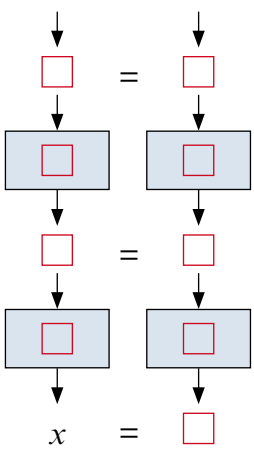
b $3(x + 1) = 12$



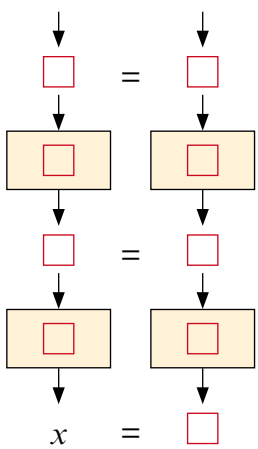
c $2(x - 6) = 24$



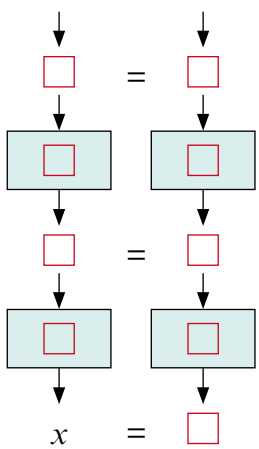
d $2(x - 5) = 8$



e $4(x + 3) = 20$



f $6(x - 5) = 12$



***14** Solve these equations.

a $3(x + 2) = 12$ **b** $4(t - 3) = 28$ **c** $5(m + 3) = 25$

d $2(n - 4) = 16$ **e** $3(p + 1) = 15$ **f** $5(y - 2) = 35$

g $3(f - 2) = 24$ **h** $6(a - 4) = 30$ **i** $2(x - 10) = 60$