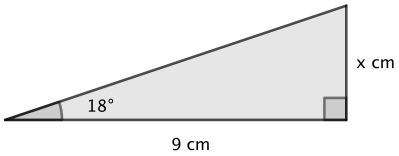
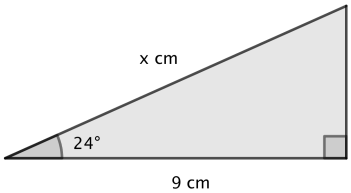
Solving Equations in Context: Review 10 FMP

1. This right-angled triangle has one side length 9 cm, and one angle 18°.



From trigonometry, we know that $\tan(18°) = \frac{x}{9}$. Solve this equation to find the length of the side marked x cm.

2. This right-angled triangle has one side marked 9 cm, and an angle 24°.



From trigonometry, we know that $\cos(24°) = \frac{9}{x}$. Solve this equation to find the length of the side marked x cm.

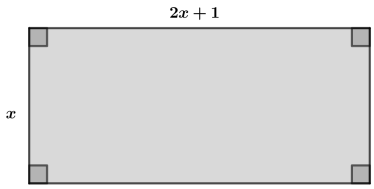
3. An arithmetic sequence has general term $u_n = 4n + 13$. The number 61 is part of this sequence. What term is the number 61? Set up an equation and solve it.

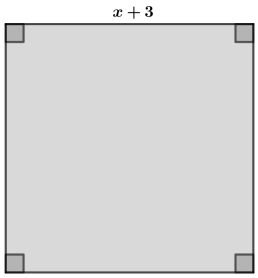
4. An arithmetic sequence has general term $u_n = 100 - 3n$. The number 31 is a term in this sequence. What term is the number 31? Set up an equation and solve it.

5. The arithmetic sequences $u_n = 6n - 5$ and $v_n = 4n + 13$ have a common term - that is, for some value of n, $u_n = v_n$. Set up an equation to find the value of n, then find the value of the term.

6. The arithmetic sequences $p_n = 5n - 1$ and $q_n = 3n + 2$ do not share a common term. How can this be proved?

7. The rectangle and the square shown below have the same perimeter. The sides of the rectangle and the side length of the square are given in terms of an unknown number x. Set up an equation to find the value of x. Then find the dimensions of each shape, and the perimeter.





8. A rectangle has perimeter 27.6 cm. The length is 5 times as long as the width. Set up an equation with this information and solve it to find the length and width of the rectangle.

9. A function is defined as $f(x) = 3x - 7$. Find x when $f(x) = 20$.

10. A function is defined as $g(x) = \frac{3(4x-5)}{2}$. Find the value of x when $g(x) = 5.1$.

11. A straight line has equation $y = 5x - 20$. Set up an equation to calculate the x intercept of the line.

12. A straight line has equation $y = 26 - 4x$. Set up an equation to calculate the x intercept.

13. A straight line has equation $3y - 5x + 12 = 0$. Calculate the x intercept and the y intercept.

14. The straight lines $y = 2x - 3$ and $y = 102 - x$ have a point in common - a point where the lines intersect each other. Set up an equation to find the x value of this point. Calculate the y value.

15. The straight lines $y = 2x - 1$ and $3y - 4x + 7 = 0$ have a point in common. Set up an equation to find the x value of this point. Calculate the y value.