19. The diagram shows a triangular prism.

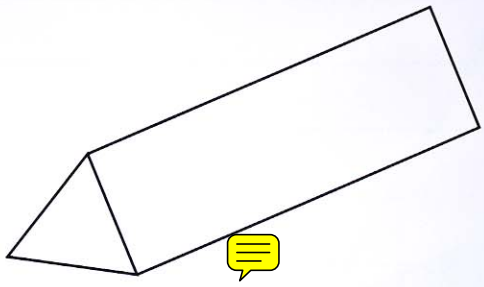

Diagram not drawn to scale.

The area of the cross-section of the triangular prism is $2x^2\,\text{cm}^2$ and the area of each of its rectangular faces is $(7x + 5)\,\text{cm}^2$.
The surface area of the triangular prism is $202\,\text{cm}^2$.

(a) Show that x satisfies the equation $4x^2 + 21x - 187 = 0$.

[3]

(b) Use the formula method to solve the equation $4x^2 + 21x - 187 = 0$, giving solutions to one decimal place.

[3]

19. *(a)* Factorise the expression $18x^2 + 27x + 4$ and hence solve the equation $18x^2 + 27x + 4 = 0$.

[3]

(b) (i) Factorise $64x^2 - y^2$.

[2]

(ii) Hence, simplify $\dfrac{64x^2 - y^2}{8x - y}$.

[1]

14. Factorise the expression $10x^2 - 11x + 3$ and hence solve the equation $10x^2 - 11x + 3 = 0$.

[3]

15. Use the formula method to solve the equation $3x^2 - 2x - 2 = 0$, giving your answers correct to two decimal places. Show your working.

[3]

19. The volume of a cuboid with height 8 cm, length $(x + 2)$ cm and width $(x - 5)$ cm is $20{\cdot}6\,\text{cm}^3$.

(a) Show that x satisfies the equation $8x^2 - 24x - 100{\cdot}6 = 0$.

[4]

(b) Use the formula method to solve the equation $8x^2 - 24x - 100{\cdot}6 = 0$, giving solutions to two decimal places.

[3]

(c) Hence write down the dimensions of the cuboid.

[1]

15. Factorise the expression $4x^2 - 81$ and hence solve the equation $4x^2 - 81 = 0$.

[3]

22. The surface area of a cuboid with length x cm, width $(x - 1)$ cm and height 3 cm is 63 cm^2.

(a) Show that x satisfies the equation $2x^2 + 10x - 69 = 0$.

[3]

(b) (i) Solve the equation $2x^2 + 10x - 69 = 0$, giving solutions to two decimal places.

[3]

(ii) Hence write down the dimensions of the cuboid.

[1]

14. $ABCD$ is a square of side 10 cm. The points P, Q, R and S lie on the sides of the square $ABCD$. $AS = BP = CQ = DR = x$ cm.

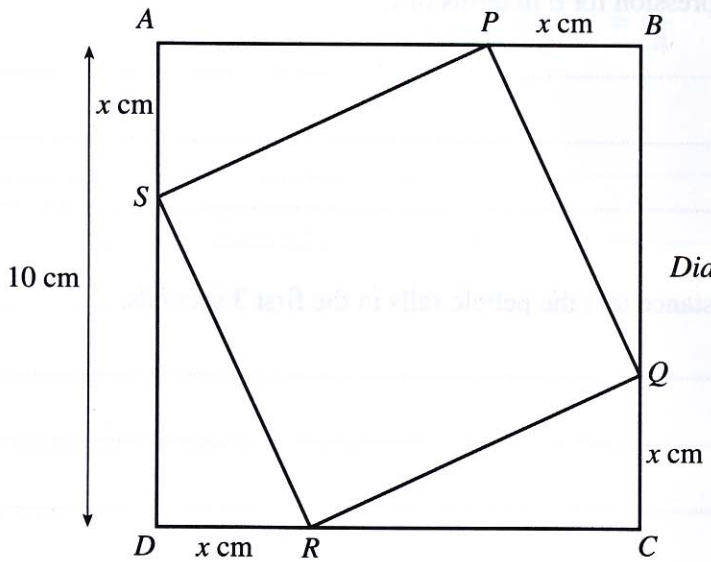

Diagram not drawn to scale.

The area of the square $PQRS$ is 75 cm^2.

(a) Show that x satisfies the equation $2x^2 - 20x + 25 = 0$.

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[3]

(b) Solve the equation $2x^2 - 20x + 25 = 0$.

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[4]

16. *(a)* Show clearly that the equation $3x - \frac{10}{x} = \frac{7}{2}$ maybe written as $6x^2 - 7x - 20 = 0$.

[2]

(b) Factorise $6x^2 - 7x - 20$.

[2]

(c) Hence solve the equation $3x - \frac{10}{x} = \frac{7}{2}$.

[2]