(Talent & Olympiad Question)

Mensuration

Multiple Choice Questions

1. What is the sum of the sides of a triangle?

(a) The length of its sides

(b) Its area

(c) Its perimeter

(d) All the above

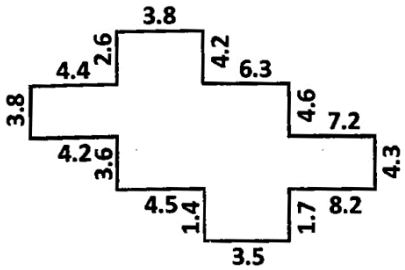
2. **Find the missing number.**

The perimeter of a square is the sum of the lengths of its _____ sides.

(a) 3 (b) 2

(c) 5 (d) 4

3. What is the perimeter of the given figure if all the measures are in *cm*?



(a) 68.2 *cm* (b) 68.1 *cm*

(c) 86.3 *cm* (d) 68.3 *cm*

4. What is the perimeter of a rectangle whose length (l) and breadth (b) are given?

(a) $2(l \times b)$ *units* (b) $(2l + 2b)$ *units*

(c) $2l + 3b$ *units* (d) $l \times b$ *units*

5. Which of the following gives the area of a square?

(a) *side* × *side* (b) 3 × *side*

(c) *side* × 4 (d) $l \times b$

6. Which among the following gives the area of a rectangle?

(a) length × 4

(b) length × breadth

(c) 3 × length

(d) breadth × 6

7. Find the area of a square whose side measures 13 *m*.

(a) 9 *m* (b) 9 *sq m*

(c) 169 *sq m* (d) 169 *m*

8. What is the area of a rectangle of length 13 *m* and breadth 12 *m*?

(a) 156 *m* (b) 156 *cm*

(c) 156 *sq m* (d) 156 *sq cm*

9. If the length and breadth of a rectangle are doubled how does its perimeter change?

(a) Tripled

(b) Doubled

(c) Halved

(d) Remains the same

10. The area of a rectangle is 120 *sq m* and its breadth is 5 *m*. Find its length.

(a) 204 *m* (b) 24 *m*

(c) 28 *m* (d) 26 *m*

11. The area of square is 144 *sq m*. What is the measure of its side?

(a) 13 *m* (b) 14 *m*

(c) $12\ m$ (d) $11\ m$

12. The length of a rectangular hall is $32\ m$. If it can be partitioned into two equal square rooms, what is the length of the partition?

(a) $16\ m$ (b) $8\ m$

(c) $4\ m$ (d) $32\ m$

13. The length of a rectangle is $\frac{6}{5}$ of its breadth. If its perimeter is $132\ m$, find its area.

(a) $1080\ m^2$ (b) $640\ m^2$

(c) $1620\ m^2$ (d) $2160\ m^2$

14. The side of a square tile is $10\ cm$. How many tiles can be fixed on one side of a wall which is $2.5\ m$ long and $2\ m$ high?

(a) 100 (b) 400

(c) 5000 (d) 500

15. What is the amount of surface enclosed by a closed plane figure?

(a) Area (b) Perimeter

(c) Volume (d) Circumference

16. Find the volume of a cube of edge $25\ cm$.

(a) $16525\ cu\ cm$ (b) $15652\ cu\ cm$

(c) $15625\ cu\ m$ (d) $15620\ cu\ cm$

17. Find the volume of a cuboid of dimensions $10\ cm, 12\ cm$ and $8\ cm$.

(a) $96\ cc$ (b) $9.6\ cc$

(c) $960\ cu\ m$ (d) $960\ cu\ cm$

18. Identify the solid figure with 6 square surfaces.

(a) A cuboid (b) A rectangle

(c) A square (d) A cube

19. Find the volume of a cube whose edge is $\frac{1}{4} cm$.

(a) $\frac{1}{16} cu\ cm$ (b) $\frac{1}{32} cu\ cm$

(c) $\frac{1}{64} cu\ cm$ (d) $\frac{1}{28} cu\ cm$

20. The edge of a cube is $25\ m$. The dimensions of a cuboid are $l = 20$, $b = 2\ m$, $h = 3\ m$. Which of the following is correct?

(a) The volume of the cube is greater than that of the cuboid.

(b) The volume of the cuboid is greater than that of the cube.

(d) Both the cube and the cuboid have the same volume.

(d) Either (a) or (c) .

21. Study the following.

P: The volume of a cube of side $12\ m$.
Q: The volume of a cuboid of dimensions $8\ m \times 6\ m \times 4\ m$.

Which of the following is correct?

(a) $P > Q$ (b) $P < Q$

(c) $P = Q$ (d) $P = 4Q$

22. Find the capacity of a box that measures $9\ cm \times 3.5\ cm \times 7.5\ cm$.

(a) $236.25\ cm^3$ (b) $189\ cm^3$

(c) $236.25\ m^3$ (d) $189\ m^3$

23. By A cuboid measuring $10\ cm$ by $2.5\ cm$ by $5\ cm$ has the same volume as a cube. What is the measure of the edge of the cube?

(a) $125\ cm$ (b) $15\ cm$

(c) 10 *cm* (d) 5 *cm*

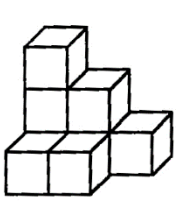
24. The shaded area of the two faces of a cube is $72\ m^2$.

What is the volume of the cube?

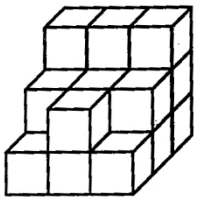
(a) $216\ m^3$ (b) $625\ m^3$

(c) $64\ m^3$ (d) $265\ m^3$

25. How many cubes must be added to solid *A* so that it becomes solid *B*?



Solid A



Solid B

(a) 8 (b) 19

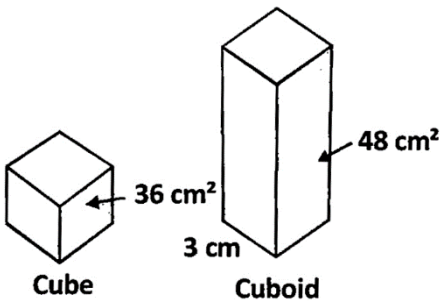
(c) 11 (d) 27

26. A cube of edge 9 *cm* was filled with $405\ cm^3$ of water. What is the height of water in the cube?

(a) 9 *cm* (b) 81 *cm*

(c) 5 *cm* (d) 25 *cm*

27. What fraction of the volume of the cube is the volume of the cuboid?



(a) $\frac{1}{3}$ (b) $\frac{2}{3}$

(c) $\frac{1}{4}$ (d) $\frac{2}{5}$

28. A rectangular tank 15 *cm* long, 12 *cm* wide and 8 *cm* high was completely filled with water. Find the volume of water in the tank.

(a) $180\ cm^3$ (b) $440\ cm^3$

(c) $1200\ cm^3$ (d) $1440\ cm^3$

29. A rectangular tank measuring 20 *cm* by 30 *cm* by 45 *cm* is filled with water to its brim. Find the capacity of the tank.

(a) 27*l* (b) $27000\ cm^3$

(c) Both (a) and (b) (d) Neither (a) nor (b)

30. The area of a carpet is $12\ m^2$. If its length is 8 *m*, what is its breadth?

(a) 1.5 m (b) 2.8 *m*

(c) 1.2 *m* (d) 0.96 *m*

31. What is the perimeter of a square tile whose area is $64\ cm^2$?

(a) 64 *cm* (b) 16 *cm*

(c) 8 *cm* (d) 32 *cm*

32. A piece of wire is bent to form a square of area $49\ cm^2$. What is the length of the piece of wire?

(a) 28 *cm* (b) $28\ cm^2$

(c) $28\ m^2$ (d) 28 *m*

33. A tank has $2250\ cm^3$ of water. $6430\ cm^3$ of water is poured into the tank to fill it to the full. What is the capacity of the tank?

(a) 868 *l*

(b) 86.8 *l*

(c) 8.68 l

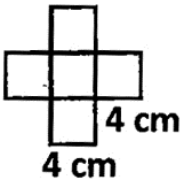
(d) 8680 l

34. Find the total volume of 4 exactly similar cubes of sides 5 cm.

(a) 125 cm^3 (b) 100 cm^3

(c) 600 cm^3 (d) 500 cm^3

(35-37): The net given is of an open top cube. Each side of the square in the net is 4 cm long.



35. What is the perimeter of the given net?

(a) 32 cm (b) 64 cm

(c) 24 cm (d) 48 cm

36. What is the area of the cardboard needed to make the given net

(a) 80 cm^2 (b) 20 cm^2

(c) 16 cm^2 (d) 100 cm^2

37. What is the capacity of the cube that can be made using the given net?

(a) 16 cm^3

(b) 64 cm^3

(c) 164 cm^3

(d) 36 cm^3

38. Which one of the following has the greatest volume?

(a) A fish tank of capacity 965 cm^3.

(b) A 1.25 l bottle of water,

(c) A cube of side 9 cm.

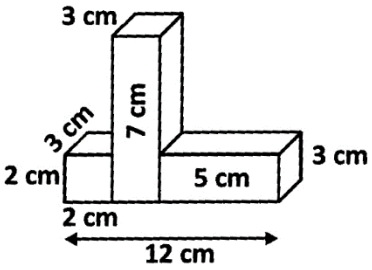
(d) A box measuring 5 cm by 2 cm by 1 cm.

39. A 2 – litre bottle is half-filled with water. How much more water must be added to fill up the bottle completely?

(a) $\frac{1}{2} cm^3$ (b) 100 cm^3

(c) 500 cm^3 (d) 1000 cm^3

40. Observe the given solid.

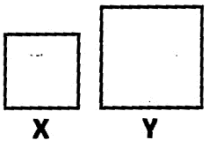


Find its volume.

(a) 48 cm^3 (b) 68 cm^3

(c) 72 cm^3 (d) 162 cm^3

(41-42); Observe the given figures.



The perimeter of square X is 20 cm, and that of square Y is 36 cm.

41. What is the difference in the length of each side of the squares?

(a) 4 cm (b) 5 cm

(c) 14 cm (d) 9 cm

42. What is their total area?

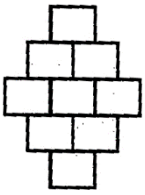
(a) 25 cm^2

(b) 106 cm^2

(c) 56 cm^2

(d) 81 cm^2

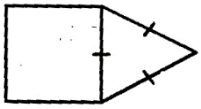
43. Find the perimeter of the given figure, if it is made up of identical squares of sides 3 cm.



(a) 60 cm (b) 36 cm

(c) 16 cm (d) 48 cm

44. The given figure is made up of a triangle and a square of area 144 cm^2.

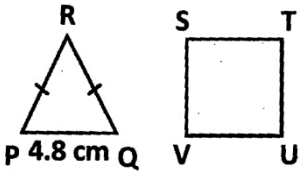


What is the perimeter of the figure?

(a) 72 cm (b) 60 cm

(c) 360 cm (d) 12 cm

45. In the given figure, each of the two equal sides of triangle PQR is 1.5 times the length of PQ.



The ratio of the perimeter of square $STUV$ to that of ΔPQR is 4 : 3. What is the area of the square?

(a) 23.04 m^2 (b) 25.6 m^2

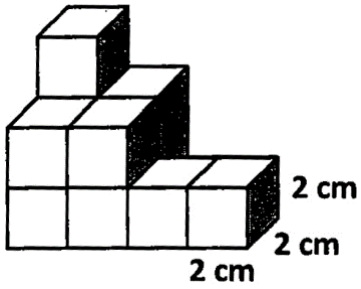
(c) 40.96 m^2 (d) 655.36 m^2

46. The length of a rectangle is 8 times its breadth. If the perimeter of the rectangle is 61.2 m, find the difference between the length and the breadth of the rectangle.

(a) 238 cm (b) 2380 cm

(c) 23.8 cm (d) 2830 cm

47. What is the total volume of the smallest number of cubes that must be added to make the given figure a cuboid?



(a) 104 cm^3 (b) 64 cm^3

(c) 27 cm^3 (d) 13 cm^3

48. The height of the water level in a tank is 5 cm. It contains 625 cm^3 of water. Find its base area.

(a) 81 cm^2 (b) 625 cm^2

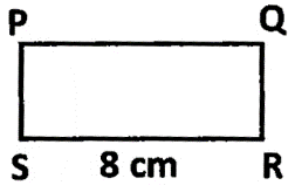
(c) 125 cm^2 (d) 50 cm^2

49. The ratio of the perimeter of a rectangle to its length is 10 : 3. If its breadth is 8 cm, what is the area of the rectangle?

(a) 81 cm^2 (b) 64 cm^2

(c) 25 cm^2 (d) 96 cm^2

50. The perimeter of rectangle $PQRS$ is 28 cm.



What is the ratio of its length to its breadth?

(a) 3 : 4

(b) 4 : 3

(c) 4 : 5

(d) 3 : 7

51. The ratio of the length of a rectangle to its breadth is $5:2$. If its area is $1690\ cm^2$, find the perimeter of the rectangle.

(a) $182\ cm$ (b) $169\ cm$

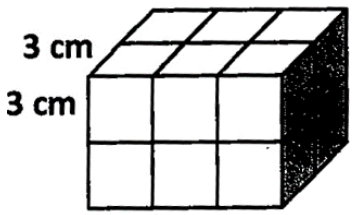
(c) $196\ cm$ (d) $264\ cm$

52. A container $12\ cm$ deep is $10\ cm$ wide and $17\ cm$ long. It is half-filled with rice. How many cubic centimetres of rice is there in the container?

(a) $1020\ cm^3$ (b) $2040\ cm^3$

(c) $510\ cm^3$ (d) $4080\ cm^3$

53. The given cuboid is made up of $3\ cm$ cubes.



What is its volume?

(a) $27\ cm^3$

(b) $108\ cm^3$

(c) $162\ cm^3$

(d) $324\ cm^3$

54. In the given figure, the rectangle has the same perimeter as the square.

If the breadth of the rectangle is $5\ cm$, what is its area?

(a) $55\ cm^3$

(b) $55\ m^2$

(c) $55\ cm^2$

(d) $55\ km^2$

55. The sides of a triangle are in the ratio $3:4:5$. If the longest side is $15\ cm$, what is the perimeter of the triangle?

(a) $18\ cm$

(b) $48\ cm$

(c) $24\ cm$

(d) $36\ cm$

Answers with Explanation

1. (c)

2. (d)

3. (d)

4. (b)

5. (a)

6. (b)

7. (c) Area of a square of side $13\ m$ is

$$13 \times 13\ sqm = 169\ sqm$$

8. (c) Area of a rectangle of length $13\ m$ and width $12\ m$

$$= 13 \times 12\ sqm = 156\ sqm$$

9. (b) Length (ℓ), Breadth (b)

$\Rightarrow \quad P = 2(\ell + b)$ units

When length and breadth are doubled,

$l \to 2l \qquad b \to 2b$

Then $\quad P = 2(2l + 2b)$

$$= 2 \times [2(l + b)] = 2 \times P$$

i.e., perimeter is doubled.

10. (b) $\text{Length} = \dfrac{Area}{breadth} = \dfrac{120\ sq\ m}{5\ m} = 24\ m$

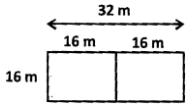
11. (c) The area of a square

i.e., side $\times$ side $= 144\ sq\ m$

$$= (12 \times 12) sq\ m$$

$\therefore$ The side of the square $= 12\ m$

12. (a)



Length of the rectangle $= 32\ m$

It is partitioned into two equal square rooms. So, side of the square room

$= \dfrac{1}{2} \times 32\ m = 16\ m =$ The length of the partition.

13. (a) Perimeter of the rectangle $= 132\ m$

$$= 2(\ell + b) = 132\ m$$

$$= 2\left(\frac{6b}{5} + b\right) = 132\ m$$

$$\Rightarrow \quad \frac{11\,b}{5} = 66\ m$$

$$\Rightarrow \quad b = \frac{66 \times 5}{11} m = 30\ m$$

$$\therefore \quad l = \frac{6\,b}{5} = \frac{66 \times 5}{11} m = 36\ m$$

Thus, area of the rectangle

$$= l \times b = \frac{6\,b}{5} = \frac{6 \times 30}{5} = 36\ m$$

14. (d)

15. (a)

16. (c)

17. (d) Volume of a cuboid $= 1 \times b \times h$

$= 10 \times 12 \times 8\ cu\ cm$

$= 960\ cu\ cm$

18. (d) A solid figure with 6 square faces is a cube.

19. (c) The volume of a cube of edge

$$\frac{1}{4} cm = \frac{1}{4 \times 4 \times 4} cu\ cm = \frac{1}{64} cu\ cm$$

20. (a) Volume of the cube $= 25 \times 25 \times 25 m^3$

$$= 15625 m^3$$

Volume of the cuboid $= 20 \times 2 \times 3$

$$= 120\ m^3$$

$\therefore$ Volume of cube $>$ Volume of cuboid.

21. (a) $P = 12 \times 12 \times 12 m^3 = 1728$ *cu m*

$Q = 8 \times 6 \times 4$ *m* $= 192$ *cu m*

Clearly, P is greater than Q.

22. (a) Dimensions of a box

$= 9$ *cm* $\times 3.5$*cm* $\times 7.5$ *cm*

Capacity of the box $= 9 \times 3.5 \times 7.5$ *cu cm*

$= 236.25$ *cu cm*

23. (d) Volume of cuboid $= 10$ *cm* $\times 2.5$ *cm* $\times 5$ *cm*

$= 50 \times 2.5 = 125$ *cm*^{3}

Volume of cuboid = Volume of a cube

$\therefore$ The measure of edge of the cube

$= 5$ *cm*

24. (a) The shaded area of two faces of the cube $= 72$ *m*^{2}

$\therefore$ The shaded area of one face

$$= \frac{72}{2} m^2 = 36 \ m^2$$

$\Rightarrow$ side or edge of the cube $= 6$ *m*

Hence, its volume $= 6 \times 6 \times 6$ *cu m*

$= 216$ *cu m*

25. (c)

26. (c)

27. (b)

28. (d) Volume of water in the tank

= Volume of the tank

$= 15 \times 12 \times 8$ *cm*^{3}

$= 1440$ *cm*^{3}

29. (c) Capacity of the tank

$= 20 \times 30 \times 45$ *cm*^{3}

$= 27000$ *cm*^{3}

$= 27 \ell$ (Since 1000 *cm*$^3 = 1 \ell$)

30. (a)

31. (d)

32. (a) Area of square formed $= 49$ *cm*^{2}

So, its side $= 7$ *cm*

Hence, the length of the wire

$= 4 \times 7$ *cm* $= 28$ *cm*

33. (c) Total volume of water in the tank

$= 2250$ *cm*$^3 + 6430$ *cm*$^3 = 8680$ *cm*^{3}

1000 *cm*$^3 = 1 \ell$

$\therefore$ 8680 *cm*$^3 = \frac{8680}{1000} \ell = 8.68 \ell$

34. (d) Volume of 4 similar cubes of side

5 *cm* $= 4 \times 5 \times 5 \times 5$ *cm*$^3 = 500$ *cm*^{3}

35. (d) The perimeter of the given net

$= 12 \times 4$ *cm* $= 48$ *cm*

36. (a) The area of the cardboard needed to make the net $= (4 \times 4) \times 5$ *cm*$^2 = 80$ *cm*^{2}

37. (b) Volume of the cube

= Area of the base $\times$ height

$= (4 \times 4)$*cm*$^2 \times 4$ *cm* $= 64$ *cm*^{3}

38. (b)

39. (d)

40. (d) Volume the given solid = Total volume of the three solids in it.

$= [(2 \times 2 \times 3) + (7 \times 3 \times 5) + (5 \times 3 \times 3)]$*cm*^{3}

$= [12 + 105 + 45]$*cm*$^3 = 162$ *cm*^{3}

41. (a) Perimeter of square X is $20\ cm$. So, its side

$= \frac{20}{4} cm = 5\ cm$

Perimeter of square Y is $36\ cm$. So, its side

$= \frac{36}{4} cm = 9\ cm$

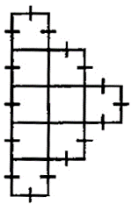
Hence, their difference $= (9-5) cm = 4\ cm$

42. (b) The total area of X and Y is

$[(5\times5)+(9\times9)] cm^2$

$= (25+81) cm^2 = 106\ cm^2$

43. (d) The given figure can be re-aligned as shown for easier computation of the number of sides.



No. of sides $= 16$

Length of each side $= 3\ cm$

Perimeter of the given figure

$= 16\times3\ cm = 48\ cm$

44. (b) Area of square $= 144\ cm^2$

$\therefore$ Its side $= 12\ cm$

Hence, the required perimeter

$= 5\times12\ cm = 60\ cm$

45. (c) According to the given problem,

$PR = RQ = 1.5\times4.8\ m = 7.2\ m$

Perimeter of $\Delta PQR = (2\times7.2+4.8) m$

$= 19.2\ m$

Ratio of perimeter of the square and the triangle $= 4:3$

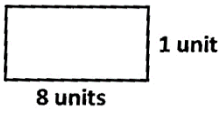
Perimeter of square $= \frac{19.2}{3}\times4 = 25.6\ m$

$\therefore$ Side of the square $= \frac{25.6}{4} m = 6.4\ m$

Hence, area of the square $= 6.4\times6.4\ m^2$

$= 40.96\ m^2$

46. (b) Perimeter $= 18$ *units*



Given perimeter $= 61.2\ m$

18 units $= 61.2\ m$

1 unit $= \frac{61.2}{18} m = 3.4\ m$

Difference between length and breadth $= 7$ units

$= 7\times3.4\ m$

$= 23.8\ m$

$= 2380\ cm$

47. (a) The given figure becomes a cuboid if it has $4\times3\times2 = 24$ cubes.

The no. of cubes in the given figure $= 11$

$\therefore$ The no. of cubes that must be added to make it a cuboid $= 24-11 = 13$

Hence, its volume $= 13\times2\times2\times2\ cm^3$

$= 104\ cm^3$

48. (c) Volume of water in a tank $= 625\ cm^3$

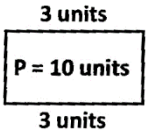
Height of the water level $= 5\ cm$

$\therefore$ Base area $= \frac{\text{Volume}}{\text{Height}}$

$= \frac{625\ \text{cm}^3}{5\ \text{cm}^3} = 125\ \text{cm}^2$

49. (d) Perimeter $= 10$ units

Ratio of perimeter and length $= 10:3$



$\therefore$ Breadth $= \dfrac{10 - 2 \times 3}{2}$

2 units $\rightarrow$ 8 *cm* (Given)

1 unit $\rightarrow$ 4 *cm*

3 units $\rightarrow 4\ cm \times 3 = 12\ cm =$ length

Area $\rightarrow 12\ cm \times 8\ cm = 96\ cm^2$

50. (b) Perimeter of rectangle $= 28\ cm$

$= 2(8 + b)cm$

$\therefore \quad b = \left(\dfrac{28}{2} - 8\right)cm$

$= (14 - 8)cm = 6\ cm$

Hence, the required ratio is $8 : 6 = 4 : 3$

51. (a) Ratio of length and breadth $= 5 : 2$

Area $= 5 \times 2 = 10$ *sq. units*

Given area $= 1690\ cm^2$

10 *sq. units* $\rightarrow 1690\ cm^2$

1 *sq.unit* $\rightarrow \dfrac{1690}{10} = 169\ cm$

1 *unit* $= 13\ cm$

Perimeter $= 2 \times 7$ *units* $= 14$ *units*

$\therefore$ Perimeter $= 14 \times 13 = 182\ cm$

52. (a) Capacity of the container

$= 12 \times 10 \times 17\ cm^3$

$= 2040\ cm^3$

As it is half filled with rice, volume of rice in the container $= \dfrac{2040}{2} cm^3$

$= 1020\ cm^3$

53. (d) Volume of each cube is

$3 \times 3 \times 3\ cm^3 = 27\ cm^3$

No. of cubes in the given $3 \times 2 \times 2 = 12$

$\therefore$ Volume of the cuboid $= 12 \times 27\ cm^3$

$= 324\ cm^3$

54. (c) Area of square $= 64\ cm^2$

Side of square $= 8\ cm$

Its perimeter $= 4 \times 8\ cm = 32\ cm$

Perimeter of rectangle $= 2(5 + \ell)$

$\dfrac{32}{2} - 5 = \ell \Rightarrow (16 - 5)cm = 11\ cm$

Area $= \ell \times b$

$= 11 \times 5 = 55\ cm^2$

55. (d) Ratio of sides of a triangle is $3 : 4 : 5$

The longest side $= 15\ cm = 5$ units

56. $\therefore$ 1 unit $= \dfrac{15}{5} cm = 3\ cm$

Hence, 3 *units* $= 9\ cm$

and 4 *units* $= 12\ cm$

Therefore, perimeter of the triangle

$= (9 + 12 + 15)cm$

$= 36\ cm$