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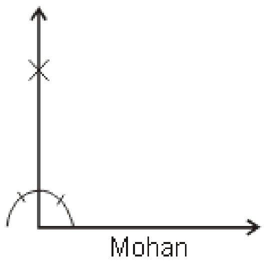
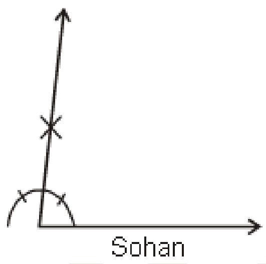
Class: 9
Subject: Mathematics
Topic: ASK15E9UT04
No. of Questions: 30

1. Mohan and Sohan constructed a right angle. Choose the correct option.
   What idea is depicted here?



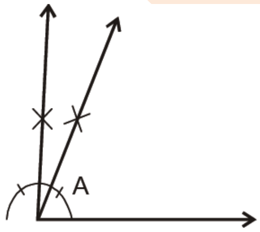


(a) Mohan is correct
(b) Sohan is correct
(c) Both are correct
(d) Both are wrong

Sol. (a)

Do correct construction

2. Choose the correct option for ∠A—



(a) $60 + \frac{1}{2} \times 60$
(b) $60 + \frac{1}{4} \times 60$
(c) $60 + \frac{1}{3} \times 60$
(d) $60 + \frac{1}{5} \times 60$

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Sol. (b)

$60 + \frac{1}{4} \times 60$

3. The perimeter of a triangular field is 240 m. It's two sides are 78 m and 50 m. Find the length of the altitude on the side of 50 m length from its opposite vertex.
(a) 67.3
(b) 67.2
(c) 67.1
(d) 67.0

Sol. (b)

Let the three sides of the triangle be a, b, c, then perimeter = a + b + c.

∴ 240 = 50 + 78 + c or c = 112 m

$s = \frac{a+b+c}{2} = \frac{240}{2} = 120$

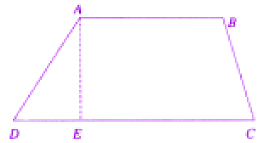
Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

Or $\frac{1}{2}$ 'base' height $= \sqrt{120 \times 70 \times 42 \times 8}$

$\Rightarrow \frac{1}{2} 50' h = \sqrt{120 \times 70 \times 42 \times 8}$

$\therefore h = 67.2\ m$

4. The area of trapezium is 1700 m^2. If one of the parallel sides is 64 m and the distance between the parallel sides is 34 m, find the length of the other parallel side.



(a) 36 m
(b) 32 m
(c) 33 m
(d) 35 m

Sol. (a)

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ABCD is a trapezium in which DC = 64 m and altitude

AE = 34 m

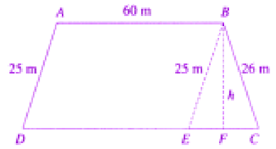
Let other parallel side AB = X m

Area (ABCD) $= \frac{1}{2}(AB + DC) \times AE$

$1700 = \frac{1}{2}(x + 64 \times 34)$

Or $x = 36\,m.$

5. The parallel side of trapezium is 77 m and 60 m and its non-parallel sides are 26 m and 25 m. find the area of the trapezium.



(a) 1643 m^2
(b) 1642 m^2
(c) 1443 m^2
(d) 1644 m^2

Sol. (d)

Let ABCD be a trapezium in which

AB = 60 m CD = 77 m, BC = 26 m, AD = 25 m

And

Draw BE ∥ to AD

Thus ABED is parallelogram

Hence AB = DE = 60 m.

AD = BE =25 m

And EC = DC –DE = 77 – 60 = 17 m

And

Now in ΔBEC,

BE = 25 m, BC = 26m, EC = 17 m

Let the height of B from EC be = h m

$S = \frac{a+b+c}{2} = \frac{25+26+17}{2} = 34$

Area of ΔBEC $= \sqrt{(s-a)(s-b)(s-c)}$

$\frac{1'}{2} EC \times \text{h} = \sqrt{34(34-25)3(34-26)(34-17)}$

$\Longrightarrow \frac{1'}{2} 17' h\sqrt{34 \times 9 \times 8 \times 7}$

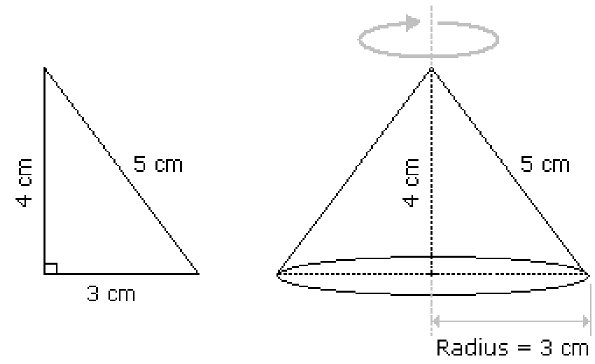
Or h = 24 m.

Now area of trapezium $= \frac{1}{2}(sum\ of\ parallel\ sides) \times height$

Area of trapezium = $\frac{1}{2}(64+77) \times 24 = 1644\ m^2$.

6. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated the side of 3 cm to form a cone. The volume of the cone so formed is:
   (a) $12\pi cm^3$
   (b) $15\ \pi cm^3$
   (c) $16\pi\ cm^3$
   (d) $20\ \pi cm^3$

Sol. (a)



Clearly, we have r = 3 cm and h = 4 cm.

$\therefore$ Volume = $\frac{1}{3}\pi r^2 h = \left(\frac{1}{3} \times \pi \times 3^2 \times 4\right) cm^3 = 12\pi\ cm^3$.

7. A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of four walls, the volume of the hall is:
   (a) 720
   (b) 900
   (c) 1200
   (d) 1800

Sol. (c)

$2(15 + 12) \times h = 2(15 \times 12)$

$\Rightarrow h = \frac{180}{27} m = \frac{20}{3} m.$

$\therefore$ Volume $= \left(15 \times 12 \times \frac{20}{3}\right) m^3 = 1200\ m^3.$

8. 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be:
   (a) 84
   (b) 90
   (c) 168
   (d) 336

Sol. (a)

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Let the length of the wire be h.

Radius $= \frac{1}{2} mm = \frac{1}{20} cm$. Then,

$\Rightarrow \frac{22}{7} \times \frac{1}{20} \times \frac{1}{20} \times h = 66.$

$\Rightarrow h = \left(\frac{66 \times 20 \times 20 \times 7}{22}\right) = 8400\ cm = 84\ m.$

9. A hollow iron pipe is 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weighs 8 g/cm^3, then the weight of the pipe is:
(a) 3.6 kg
(b) 3.696 kg
(c) 36 kg
(d) 36.9 kg

Sol. (b)

External radius = 4 cm,

Internal radius = 3 cm.

Volume of iron $= \left(\frac{22}{7} \times [(4)^2 - (3)^2] \times 11\right)\ cm^2$

$= \left(\frac{22}{7} \times 7 \times 1 \times 21\right)\ cm^3$

$= 462\ cm^3.$

∴ weight of iron = (462×8) gm = 3696 gm = 3.696 kg.

10. 50 men took a dip in a water tank 40 m long and 20 m broad on a religious day. If the average displacement of water by a man is 4 m^3, then the rise in the water level in the tank will be:
(a) 20 cm
(b) 25 cm
(c) 35 cm
(d) 50 cm

Sol. (b)

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Total volume of water displaced $= (4 \times 50)\ m^3 = 200\ m^3$.

∴ Rise in water level $= \left(\frac{200}{40\times20}\right) m\ 0.25\ m = 25\ cm.$

11. The slant height of a right circular cone is 10 m and its height is 8 m. Find the area of its curved surface.
    (a) $30\ \pi\ m^2$
    (b) $40\pi\ m^2$
    (c) $60\ \pi\ m^2$
    (d) $80\pi\ m^2$

Sol. (c)

$l = 10\ m,$

$h = 8\ m.$

So, $r = \sqrt{l^2 - h^2} = \sqrt{(10)^2 - 8^2} = 6\ m.$

∴ Curved surface area $= \pi r l = (\pi \times 6 \times 10)\ m^2 = 60\ \pi\ m^2$

12. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3. Find the ratio of its diameter to its height.
    (a) 3 : 7
    (b) 7 : 3
    (c) 6 : 7
    (d) 7 : 6

Sol. (b)

$\frac{\prod r^2 h}{2\prod r h} = \frac{924}{264} \quad \Rightarrow \quad r = \left(\frac{924}{264} \times 2\right) = 7\ m.$

And, $2\prod rh = 264 \qquad \Rightarrow \quad h = \left(264 \times \frac{7}{22} \times \frac{1}{2} \times \frac{1}{7}\right) = 6\ m.$

∴ Required ratio $= \frac{2r}{h} = \frac{14}{6} = 7 : 3.$

13. What is the total surface area of a right circular cone of height 14 cm and base radius 7 cm?
    (a) 462 cm^2

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(b) 498.35 cm^2
(c) 344.35 cm^2
(d) None of these

Sol. (b)

$h = 14\ cm, r = 7\ cm.$

So, l $= \sqrt{(7)^2 + (14)^2} = \sqrt{245} = 7\sqrt{5}\ cm.$

∴ Total surface area = $\prod rl + \prod r^2$

$= \left(\frac{22}{7} \times 7 \times \sqrt{5} + \frac{22}{7} \times 7 \times 7\right) cm^2$

$= [154(\sqrt{5} + 11)] cm^2$

$= (154 \times 3.236) cm^2$

$498.35\ cm^2.$

14. How many bricks, each measuring 25 cm x 11.25 cm x 6 cm, will be needed to build a wall of 8 m x 6 m x 22.5 cm?
(a) 5600
(b) 6000
(c) 6400
(d) 7200

Sol. (c)

$Number\ of\ bricks = \frac{Volume\ of\ the\ wall}{Volume\ of\ 1\ rbick} = \left(\frac{800 \times 600 \times 22.5}{25 \times 11.25 \times 6}\right) = 6400.$

15. Find the percentage increase in the area of a triangle if the each side is doubled.
(a) 200 %
(b) 400%
(c) 500%
(d) 300%

Sol. (d)

Let a, b, c, be the sides of the old triangle and ‘s’ be its semi-perimeter.

Then, s $= \frac{1}{2}(a+b+c)$

The siders of the ne triangle are 2a, 2b and 2c. Let's be its semi-perimeter. Then,

$s' = \frac{1}{2} \times (2a+2b+2c) = (a+b+c) = 2s.$

Let Δ and Δ's be the area of the old and new triangles respectively. Then,

$\Delta' = \sqrt{s(s-a)(s-b)(s-c)}$

$\Delta' = \sqrt{s'(s'-2a)(s'-2b)(s'-c)}$

$\Longrightarrow \Delta' = \sqrt{2s(2s-2a)(2s-2b)(2s-2c)}$

$= 4\sqrt{s(s-a)(s-b)(s-c)} = 4\Delta$

Increase in area of triangle = Δ' –Δ

= 4Δ – Δ = 3Δ.

Hence, percentage increase in area

$= \left(\frac{3\Delta}{\Delta} \times 100\right) = 300\%$

16. Area of an isosceles triangle, the measure of one of its equal side being 5 cm. and the third side 4 cm is
(a) $2\sqrt{21}\,cm^2$
(b) $21\sqrt{2}\,cm^2$
(c) $22\sqrt{3}\,cm^2$
(d) $23.66\,cm^2$

Sol. (a)

Let a = 5 cm, b = 4 cm.

Therefore area of an isosceles triangle

$= \frac{b}{4} \times \sqrt{4a^2 - b^2} = \frac{4}{4}\sqrt{4 \times 25 - 16}\,sq.cm.$

$= \sqrt{84}\,cm. = 2\sqrt{21}\,sq.cm.$

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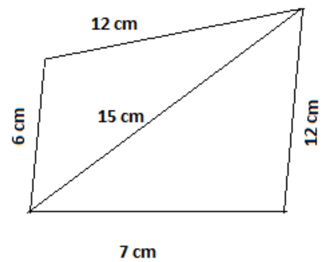
17. Area of the quadrilateral BACD whose diagonal AC = 15 cm. and sides AB = 7 cm, BC = 12 cm, CD = 12 cm and DA = 9 cm is
(a) 25.9 cm^2
(b) 29.3 cm^2
(c) 95.2 cm^2
(d) 92.5 cm^2

Sol. (c)

We know that the diagonal of a quadrilateral divides in into two triangles.



As per figure, in ΔABC

AB = 7 cm, BC = 12 cm, AC = 15

Therefore semi perimeter $s = \frac{7+12+15}{2} = 17\ cm$

Area of ΔABC

$= \sqrt{17 \times (17-7) \times (17-12) \times (17-15)}$

$= \sqrt{17 \times 10 \times 5 \times 2}\ sq.cm.$

$= \sqrt{14}\ sq.cm. = 10 \times 4.12 = 41.2\ sq.cm.$

Similarly for ΔACD, AC = 15 cm, CD = 12 cm and DA = 9 cm

Therefore, $s = \frac{15+12+9}{2} = \frac{36}{2} = 18\ cm.$

Area of ΔACD

$= \sqrt{18 \times (18-15) \times (18-12) \times (18-9)}$

$= \sqrt{18 \times 3 \times 6 \times 9} = 54\ sq.cm.$

Area of quadrilateral ABCD

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$= Area\ of\ \Delta ABC + Area\ of\ \Delta ACD$

$= 41.2 + 54 = 95.2\ sq.cm.$

18. A regular hexagon has a side 6 cm. Its perimeter and area are
   (a) 35 cm $8\sqrt{3}\ cm^2$
   (b) 38 cm, $10\sqrt{2}\ cm^2$
   (c) 40 cm, $11\sqrt{2}\ cm^2$
   (d) 36 cm, 54 $\sqrt{3}\ cm^2$

Sol. (d)

Side = 6 cm

∴ Perimeter of regular hexagon = 6 × 6 = 36 cm

ABCDEF is a regular hexagon. Join diagonals AD, BE and CF, The three diagonal divides the hexagonal in six. Congruent equilateral triangle with side 6 cm.

Area of one such triangle

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{9(9-6)(9-9)(9-6)} = \sqrt{9 \times 3 \times 3 \times 3} = 9\sqrt{3}$

∴ Area of the regular hexagon

$= 6 \times Area\ of\ equilateral\ triangle\ OAB$

$= 6 \times 9\sqrt{3} = 54\sqrt{3}\ cm^2$

19. Find the area of an equilateral triangle having each side's length 4 cm.
   (a) $3\sqrt{3}$
   (b) $4\sqrt{3}$
   (c) 2 $\sqrt{3}$
   (d) $5\sqrt{3}$

Sol. (b)

$a = b = c = 4$

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$s = \frac{a+b+c}{2} = \frac{4+4+4}{2} = 6$

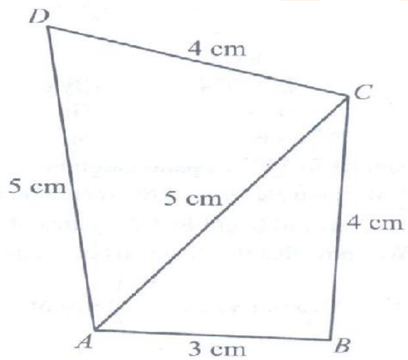
Area of a triangle by Heron's formula

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{6(6-4)(6-4)(6-4)}$

$= \sqrt{48} = \sqrt{4 \times 4 \times 3} = 4\sqrt{3}\ cm^2$

20. Find the area of a quadrilateral ABCDE in which AB = 3 cm, BC = 4 cm, CD = 4 cm, DA = 5 cm and AC = 5 cm.



(a) 6 $cm^2 - 2\sqrt{21}\ cm^2$
(b) - 6 $cm^2 + 2\sqrt{21}\ cm^2$
(c) 6 $cm^2 + 2\sqrt{21}\ cm^2$
(d) 6 $cm^2 + 3\sqrt{21}\ cm^2$

Sol. (c)

We divide the quadrilateral ABCD in two triangle ABC and ACD. For ΔABC, a = 3, b = 4, c = 5

$s = \frac{3+4+5}{2}\ cm = 6\ cm$

Area (ΔABC) = $\sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{6(6-3)(6-4)(6-5)} = \sqrt{6 \times 3 \times 2 \times 1} = 6\ cm^2$$

Similarly, for ΔACD,

$$a = 5\ cm, b = 5\ cm, c = 4cm$$

$s = \frac{5+5+4}{2} cm = 7\ cm$

Area (ΔACD) = $\sqrt{s(s-a)(s-b)(s-c)} = \sqrt{7(7-s)(7-s)(7-4)}$

$= \sqrt{7 \times 2 \times 2 \times 3} = 2 \times \sqrt{21}\ cm^2$

∴ Area of quadrilateral ABCD = Area of triangle ABC + Area of triangle

ACD = 6 cm^2 $+2\sqrt{21}\ cm^2$

21. What is the height of the cone if the diameter is 8 cm and volume is 48π cm^3.
    (a) 8 cm
    (b) 7 cm
    (c) 9 cm
    (d) 3 cm

Sol. (c)

Let h cm be the height of the cone

D = Diameter of the cone = 8 cm

∴ r = Radius of the cone = 4 cm

Now, Volume of the cone = 4π cm^3

As we know V= $\frac{1}{3}\pi r^2 h$

$\Longrightarrow \frac{1}{3} \times \pi \times 4 \times 4 \times h$=48π

$\Longrightarrow h = \frac{48\pi \times 3}{16\pi} cm = 9\ cm$

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Hence, the height of the cone is 9 cm.

22. A cone and cylinder are having the same base. Find the ration of their heights if their volumes are equal.
(a) 3 : 1
(b) 1 : 3
(c) 2 : 3
(d) 3 : 2

Sol. (a)

Let the radius of the common base be r. Let h_1 and h_2 be the heights of the cone and cylinder respectively. Then, volume of the cone $= \frac{1}{3}\pi r^2 h_1 = \pi r^2 h_2$

It is given that the cone and the cylinder are of the same volume.

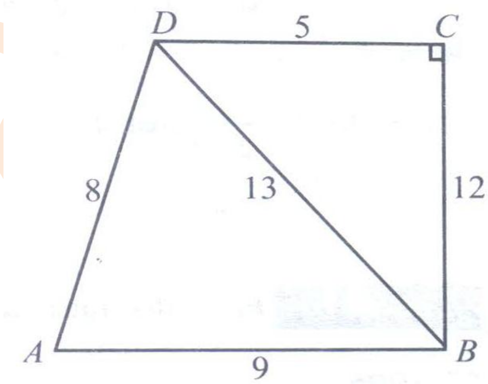
$$\therefore \frac{1}{3}\pi r^2 h_1 = \pi r^2 h_2$$

$$\Longrightarrow \frac{1}{3}h_1 = h_2$$

$$\Longrightarrow \frac{h_1}{h_2} = \frac{3}{1} \quad \Longrightarrow h_1 : h_2 = 3 : 1$$

Hence, the ratio of the height of the cone and cylinder is 3 : 1

23. A park, in the shape of a quadrilateral ABCD, has ∠C = 90°, AB = 9 m, BC = 12 m, CD = 5 m, and AD = 8 M. How much area does it occupy?



(a) 25 m²
(b) 27 m²
(c) 26 m²

(d) 30 m^2

Sol. (d)

Given, a quadrilateral ABCD in which AB = 9m, BC = 12m, CD = 5m, and AC = 8m.

We divide the quadrilateral in two triangular region ABD and BCD,

Now, IN ΔBCD it angle at C, we have

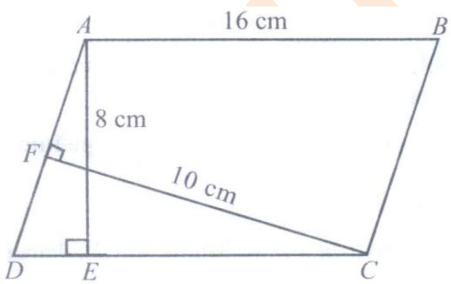
$BD^2 = BC^2 + CD^2$ [By pythagorous theorem]

$= 5^2 + 12^2 = 25 + 144 = 169\, m^2$

$BD = \sqrt{169} = 13\, M$

∴ Area of ΔBCD $= \frac{1}{2} \times base \times height = \frac{1}{2} \times 5 \times 12 = 30\, m^2$

24. In Figure, ABCD is a parallelogram AE ⊥ DC and CF ⊥ AD. If AB = 16 cm, AE = 8 CM and CF = 10 cm find AD.



(a) 12.4 cm
(b) 12.8 cm
(c) 12.3 cm
(d) 12.5 cm

Sol. (b)

We have AB = 16 cm, AE = 8 cm, CF = 10 cm

ABCD = CD × AE = 16 × 8 = 128 cm^{2-}

Again Area of parallelogram = base × height = AD × CF

$$128 = AD \times 10$$

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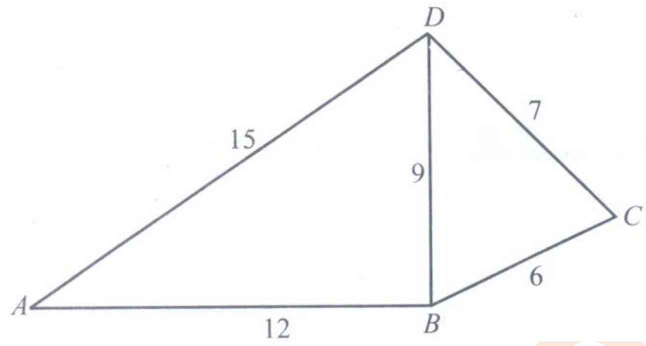
$AD = \frac{128}{10} = 12.8\ cm.$

25. Find the area of the quadrilateral ABCD in which AB = 12 cm, BC = 6 cm, CD = 7 cm BD = 9 cm and AD = 15 cm.



(a) 74. 97 cm^2
(b) 74.96 cm^2
(c) 74. 99 cm^2
(d) 74.98 cm^2

Sol. (d)

In the quadrilateral ABCD diagonal BD divides in into two triangles ABD and BCD.

∴ Area of quadrilateral ABCD = Area of ΔABD + Area of ΔBCD

For ΔABD,

$a = 12\ cm, b = cm\ c = 15\ cm$

$s = \frac{a+b+c}{2} = \frac{12+9+15}{2} = 18\ cm$

Applying Heron's formula for ΔABD

$\Delta = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{18(18-12)(18-9)(18-15)}$

$= \sqrt{18 \times 6 \times 9 \times 3}$

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$= 18 \times 3 = 54\ cm^2$

For ΔBCD,

$a = 6\ cm, b = 7\ cm, c = 9\ cm$

$s = \frac{6+7+9}{2} = 11\ cm$

Applying Heron's formula for ΔBCD

∴ Area of Quadrilateral ABCD = 54+20.98 [From (i)]

$= 74.98\ cm^2$

26. The adjacent sides of a ∥ gm ABCD measure are 34 cm, and 20 cm and the diagonal AC is 42 cm. area of the ∥ gm.
    (a) 86 cm^2
    (b) 87 cm^2
    (c) 89 cm^2
    (d) 90 cm^2

Sol. (a)

∥ gm ABCD can be divided into two triangles ABC and ACD.

Now, ABCD is a ∥ gm

So, AB = CD = 34 cm

BC = DA = 20 cm

In ΔABC,

$a = 34\ cm, b = 20\ cm, c = 42\ cm$

$s = \frac{a+b+c}{2} = \frac{34+20+42}{2} = 43\ cm$

Applying Heron's formula

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Area of ΔABC $= \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{43(43-34)(43-20)(43-42)}$

Area of ‖ gm ABCD = 2 × Area of ΔABC

27. Water in a rectangular reservoir having base 80 m by 60 m is 6.5 m deep. In what time can the water be emptied by a pipe of which the cross-section is a square of side 20 cm, if the water runs through the pipe at the rate of 15 km/hr?
    (a) 51 hours
    (b) 53 hours
    (c) 54 hours
    (d) 52 hours

Sol. (d)

Dimension of the reservoir is 80 m, 60 m and 6.5 m

So its volume will be

$$V = 60 \times 80 \times 6.5 = 45 \times 650\ m^3$$

Now, Dimension of pipe is 20 cm, 20 cm.

So its area of cross-section $= \frac{20}{100} \times \frac{20}{100}\ m^2$

Rate of flow of water through the pipe $= 15\ km\ hr - 1$

In 1 hr volume of water that flow out through the pipe = 15000 $\frac{20}{100} \times \frac{20}{100} m^3$

Let after 't' hours the whole reservoir becomes emptied so the volume of water that flows our through the pipe after 't' hours

$$= 15000 \times \frac{20}{100} \times \frac{20}{100} \times t\ m^3$$

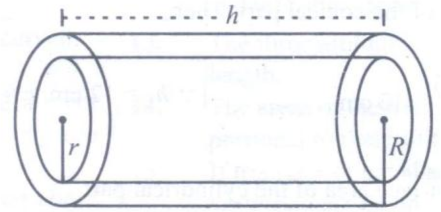
$$\therefore 15000 \times \frac{20}{100} \times \frac{20}{100} \times t = 48 \times 650$$

600 t = 48 × 650

$$t = \frac{48 \times 650}{600} = 52\ hr$$

So the required time will be 52 hours.

28. A cylindrical tube, open at both ends, is made of metal. The internal diameter of the tube is 10.4 cm and its length is 25 cm. The thickness of the metal is 8 mm everywhere. Calculate the volume of the metal.



(a) 705 cm^2
(b) 703 cm^2
(c) 704 cm^2
(d) 702 cm^2

Sol. (c)

Internal diameter of the tube = 10.4 cm

Hence internal radius (r) = 5.2 cm

$h =$ length of the tube = 25 cm

Let t = thickness = 8 mm = $\frac{8}{10} cm = 0.8\ cm$

So, external radius (R) = 5.2+0.8=6 cm

Now, volume of the metal which is the volume of the shaded protion

$$= \pi R^2 h - \pi r^2 h = \pi h(R^2 - r^2)$$

Putting the values, we get

$$V = \frac{22}{7} \times 25 \times (6^2 - 5.2)^2$$

$$= \frac{22}{7} \times 25 \times (6 + 5.2)(6 - 5.2)$$

$$= \frac{22}{7} \times 25 \times 11.2 \times 0.8 = 704\ cm^3$$

29. A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on the height and radius of the cylindrical part are 13 cm and 5 cm respectively. The radii of the hemispherical and conical parts are the same as that of the cylindrical part. Calculate the surface area of the toy if height of conical part is 12 cm.

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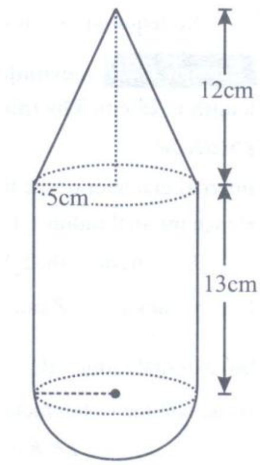

(a) 772 cm^2
(b) 771 cm^2
(c) 773 cm^2
(d) 770 cm^2

Sol. (d)

Let r cm be the radius and h cm the height of the cylindrical part. Then,

$$r = 5\ cm\ and\ h = 13\ cm.$$

Clearly, radii of the spherical part and base of the conical part are also r cm. Let $h_1\ cm$ be the height, l cm be the slant height of the conical part. Then,

$$l^2 = r^2 + h_1^2$$

$$\Longrightarrow l = \sqrt{r^2 + h_1^2} \quad \Longrightarrow l = \sqrt{5^2 + 12^2} = 13\ cm \qquad [\because h_1 = 12\ cm, r = 5\ cm]$$

Now,

Surface area of the toy = Curved surface area of the cylindrical part

+ Curved surface area o hemispherical part

+ Curved surface area of conical part

$$(2\pi h + 2\pi r^2 + \pi rl)cm^2$$

$$= \frac{22}{7} \times 5 \times (2 \times 13 + 2 \times 5 + 13)\ cm^2$$

$$\frac{22}{7} \times 5 \times 49\ cm^2 = 770\ cm^2$$

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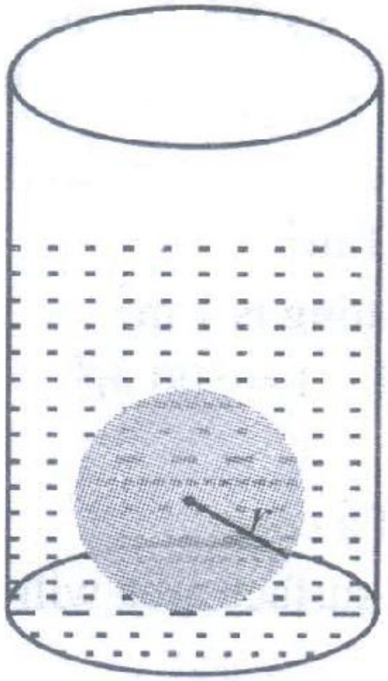
30. A cylindrical tub of radius 12 cm contains water to a depth of 20 cm. A spherical ball is dropped into the tube and thus level of water is raised by 6.75 cm. What is the radius of the ball?



(a) 7 cm
(b) 8 cm
(c) 9 cm
(d) 6 cm

Sol. (c)

Given $R^2 =$ radius of cylindrical tub = 12 cm

H = height of water level = 20 cm

h = level of water which raises = 6.75 cm

Let r = radius of spherical ball

Now, volume of spherical ball = volume of water level raised

$$\frac{4}{3}\pi r^3 = \pi R^2 h$$

$$r^3 = \frac{3}{4} \times 12 \times 12 \times 6.75 = 729$$

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$r = (729)^{1/3} = 9\ cm$