1. In a hemispherical igloo, an Eskimo's head just touches the roof when he stands erect at the centre of the floor, but his son can play over an area of 9856 square units of the floor without stooping. If the Eskimo's height is 65 units, what is his son's height?
(A) 25 units (B) 33 units (C) 35 units
(D) 37 units (E) Insufficient data

2. The figure ABCD is a rectangle with AD = 5 units and AE = EB. EF is perpendicular to DB and is half of DF. If the area of the triangle DEF is 9 sq units, what is the area of ABCD (in sq units)?

(A) $40\sqrt{5}$ (B) $50\sqrt{5}$ (C) $20\sqrt{5}$ (D) $30\sqrt{5}$ (E) $25\sqrt{5}$

3. A circular hole is cut in a circular disc of diameter $3\frac{1}{3}$ m so that the weight of the disc is reduced to 1/4 of its original weight. The diameter of the hole is

(A) $3\sqrt{3}$ m (B) 4.5 m (C) 5.4 m (D) $5/\sqrt{3}$ m (E) $2\sqrt{4}$

4. In a trapezium ABCD, AB is parallel to DC, AB = 3DC, and the diagonals of the trapezium intersect at O. The ratio of the area of ΔOCD to the area of ΔOAB is:

(A) 1 : 9 (B) 1 : 3 (C) 3 : 1
(D) 1 : 10 (E) Cannot be determined

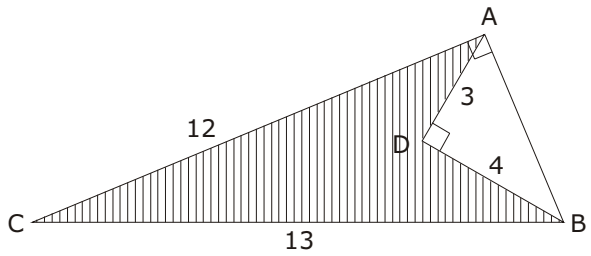
5. A pyramid has a height of 12 inches and a base with an area of 81 square inches. What is the area of a cross section 8 inches away from the base?

(A) 27 (B) 24 (C) 21 (D) 9 (E) 144

6. A sphere has a diameter of 500 mm. What is the edge length of the largest possible cube that would be able to fit within the sphere? (Approximate integer)

(A) 232 mm (B) $\frac{500}{\sqrt{3}}$ mm (C) 271 mm (D) $\frac{500}{\sqrt{2}}$ mm (E) $\frac{500}{\sqrt{7}}$ mm

7. In the figure $\angle ADB = \angle BAC = 90^{o}$. AD = 3", BD = 4", BC = 13". Calculate the area of the shaded portion in in^2.

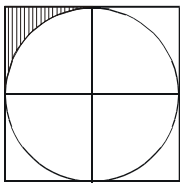


(A) 12 (B) 52 (C) 24 (D) 39 (E) 54

8. A rectangular grassy plot measures 112 ft by 78 ft. It has a gravel path $2\frac{1}{2}$ ft wide all round it on the inside. The cost of constructing the path at the rate of 72 cents per square yard will be:

(A) \$923 (B) \$7811 (C) \$74 (D) \$66.66 (E) \$666

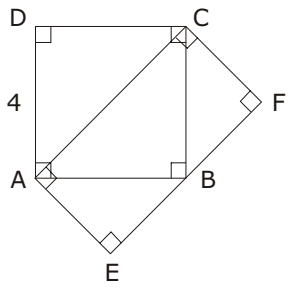
9. ABCD is a square. If the shaded area is A, the side of the square is:



(A) $\sqrt{\frac{4A}{1 - x}}$ (B) $\sqrt{4(4 - \pi)A}$ (C) $\sqrt{16(4 - \pi)}$

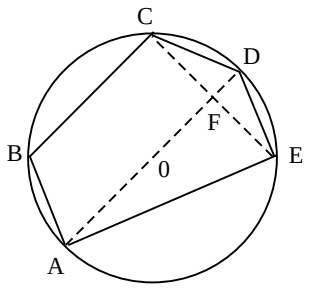
(D) $\sqrt{\frac{16A}{4 - \pi}}$ (E) $\frac{4L - \pi L}{4}$

10. The area of the rectangle AEFC in the figure is:



(A) 10 cm^2 (B) 12 cm^2 (C) 16 cm^2
(D) 24 cm^2 (E) L^2 cm^2

11. In the diagram alongside, O is the centre of the circle and AD passes through the centre of the circle. BC || AD, CE $\perp$ AD, CF = FE, AF = 8, FD = 2, BC = 6. Find the area of pentagon ABCDE.



(A) 24 (B) 30 (C) 36 (D) 52 (E) 72

12. If S is the surface area of a cuboid of dimensions x, y and z and V is the volume then $\frac{1}{S}$ is equal to:

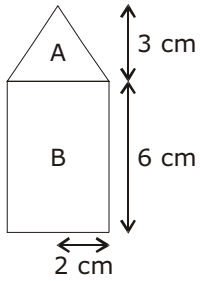
(A) $\frac{V}{2}(x+y+z)$ (B) $\frac{1}{2V\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)}$ (C) $\frac{V}{x+y+z}$

(D) $\frac{x+y+z}{V}$ (E) $2V\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)$

13. A cone has a radius r and height h. It is melted and 3 identical cones are formed each having the same radius as the original cone and height H. What is the value of $\frac{h}{H}$?

(A) $\frac{1}{3}$ (B) 1 (C) 3 (D) 9 (E) 6

14. A is a right circular cylinder on which is placed a cone B. The entire structure is melted and spheres are formed each having radius 1 cm. How many spheres can be formed?



(A) 18 (B) 20 (C) 21
(D) 23 (E) 7

15. If the radius of a sphere goes up by 10%, by what percent do the surface area and volume go up?

(A) 21%, 30% (B) 20%, 33% (C) 33%, 21%
(D) 21%, 33% (E) 20%, 30%

DIRECTIONS for Data Sufficiency questions: Each of the data sufficiency problems below consists of a question and two statements, labeled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the data given in the statements plus your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of counterclockwise), you are to blacken space.

(A) if statement (1) BY ITSELF is sufficient;

(B) if statement (2) BY ITSELF is sufficient;

(C) if statements (1) and (2) TAKEN TOGETHER are sufficient;

(D) if EITHER statement by ITSELF is sufficient;

(E) if (1) and (2) TOGETHER are NOT SUFFICIENT.

16. What is the ratio of the side of the cube to the radius of the sphere?

    I. The sphere and the cube have equal volumes.

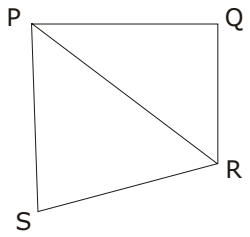
    II. Volume of the cube is 64 cm^3.

17. A cube is cut into smaller cubes, each having equal sides. What is the maximum number of smaller cubes that can be formed?

    I. The ratio of the side of the bigger cube to the smaller cube is 2 : 1.

    II. The side of the bigger cube is 4 cm and that of the smaller cube is 2 cm.

18. In the adjoining figure, PR = 20, QR = 12 and PQ = 16. What is the length of QS?



I. □PQRS is a parallelogram.

II. $\angle PQR = 90^{o}$.

19. Find the number of cubes required to erect a pillar of volume 20 m^3?

I. The edge of the cube is 0.5 m.

II. The pillar is a base of 1 m $\times$ 1 m and is 20 m high.

20. A road roller is used to press a ground of area 2200 sq. meter. How many rotations does it make?

I. The diameter of the road roller is 1.75 m.

II. The breadth of the road roller is 2 m.

Questions: 15 Time: 15 minutes

***DIRECTIONS for Problem Solving questions*: Solve each problem, using any available space on the page for scratchwork. Then indicate the best of the answer choices given.**

Numbers: All numbers used are real numbers.

Figures: Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

***DIRECTIONS for Data Sufficiency questions*: Each of the data sufficiency problems below consists of a question and two statements, labeled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the data given in the statements plus your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of counterclockwise), you are to blacken space.**

(A) if statement (1) BY ITSELF is sufficient;

(B) if statement (2) BY ITSELF is sufficient;

(C) if statements (1) and (2) TAKEN TOGETHER are sufficient;

(D) if EITHER statement by ITSELF is sufficient;

(E) if (1) and (2) TOGETHER are NOT SUFFICIENT.

Numbers: All numbers used are real numbers.

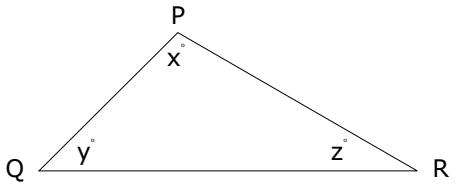
Figures: A figure in a data sufficiency problem will conform to the information given in the question, but will not necessarily conform to the additional information given in statements (1) and (2).

You may assume that lines shown as straight are straight and that angle measures are greater than zero.

You may assume that the position of points, angles, regions, etc., exist in the order shown.

All figures lie in a plane unless otherwise indicated.

Example:

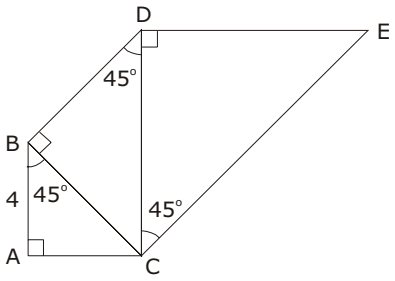


In Δ PQR, what is the value of x?
(1) PQ = PR
(2) y = 40

Explanation:

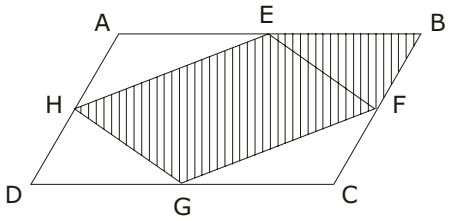
According to statement (1), PQ = PR; therefore, Δ PQR is isosceles and y = z. Since x + y + z = 180, x + 2y = 180. Since statement (1) does not give a value for y, you cannot answer the question using statement (1) by itself. According to statement (2), y = 40; therefore, x + z = 140. Since statement (2) does not give a value for z, you cannot answer the question using statement (2) by itself. Using both statements together, you can find y and z; therefore, you can find x, and the answer to the problem is C.

1. What is the area of the pentagon ABDCE in the adjoining figure?



(A) 32
(B) 64
(C) 24
(D) 56
(E) 72

2. In the figure alongside, ABCD is a parallelogram and E, F, G and H are midpoints of its respective sides. What is the ratio of the shaded area to that of the unshaded?

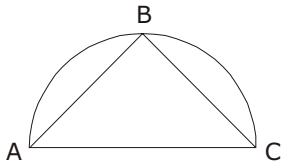


(A) 3 : 5 (B) 5 : 3
(C) 5 : 8 (D) 3 : 8
(E) 8 : 5

3. A closed cuboid tank of dimensions 3 ft $\times$ 4 ft $\times$ 5 ft is 2/3rd filled with water. Find the height of the water in the tank if its base is a rectangle of the size 3 ft $\times$ 4 ft.

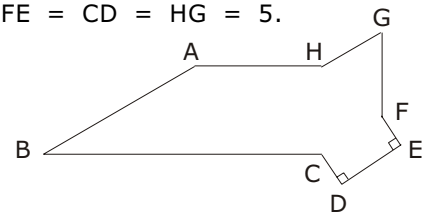
(A) 10 feet (B) 13 feet (C) $\frac{10}{3}$ feet (D) 9 feet (E) 8.7 feet

4. A garden which is in a shape of an isosceles triangle has two parking lots as shown in the figure. What is the area of the garden if the area of the parking lot is $16\pi - 32$?



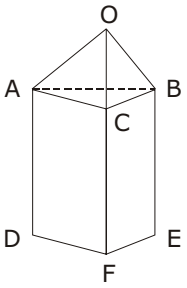
(A) 4 (B) 8 (C) 32
(D) 1 (E) 1/2

5. In the figure alongside, AB = AH = GF = ED = 10 and FE = CD = HG = 5. $\angle ABC = \angle HGF = 30^o$; $\angle BCD = 150^o$. Find the area.



(A) $75 + \frac{125\sqrt{3}}{2}$ (B) $\frac{275}{2}\sqrt{3}$ (C) $100\sqrt{3}$
(D) 263 (E) 265

6. A toy is in the shape of a triangular pyramid which has a prism at its top as shown in the figure. If each of its edges is 4 inches, what is the total surface area of the toy in square inches?



(A) $64\sqrt{3}$ (B) $48\sqrt{3}$ (C) $48 + 16\sqrt{3}$
(D) $12\sqrt{3}$ (E) $16 + 64\sqrt{3}$

Tick guessed questions

1.☐ 2.☐ 3.☐ 4.☐ 5.☐ 6.☐

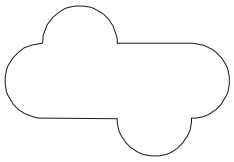
7. A cuboidal room 8 feet wide, 12 feet long and 14 feet high has an attic at a height of 7 feet along its length. If the attic is 4 feet wide, what is the length of the longest ladder that can be put from one of its corners to the attic?

(A) $\sqrt{404}$ (B) $\sqrt{209}$ (C) $\sqrt{272}$ (D) 13 (E) 17.89

8. A toy is such that its upper part is a right circular cone based on a cylinder. One third of the cylindrical part of the toy is fitted in a cube. If the height of the toy is 16 cm and that of the cone is 4 cm, find the volume of the toy.

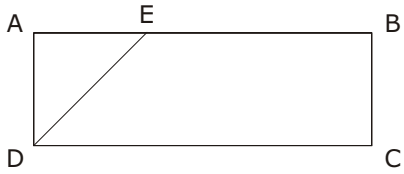
(A) $\frac{304}{3}\pi$ cu. cm. (B) $\frac{112}{3}\pi + 64$ cu. cm. (C) $\frac{112}{3}\pi$ cu. cm.
(D) 64 cu. cm. (E) 112 cu. cm.

9. The adjacent figure shows the shape of a sign to be placed in front of a store. The sign has four semicircles placed around a rectangle. If each of the semicircles is 14 cm in diameter, what is the total area of the sign?



(A) 700 cm^2 (B) 1600 cm^2 (C) 794 cm^2
(D) 848 cm^2 (E) 1200 cm^2

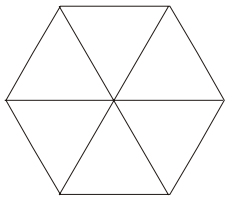
10. In the adjoining figure, ABCD is a rectangle and E is a point on AB. What is the ratio of the area of ΔADE to the area of $\square ABCD$?



I. AB = 15 and BC = 5.

II. $\frac{AE}{EB} = \frac{1}{2}$

11. A hexagonal tile has a design of 6 triangles in it painted in different colors as shown in the adjacent figure. What is the area of the tile?



I. The six triangles so formed are all equilateral triangles of side 4.
II. The tile is in the shape of a regular hexagon.

12. What is the volume of the cube?

I. The total surface area of the cube is equal to its volume in cm^3.
II. The side of the cube is greater than 5 inches.

13. What is the volume of the hemispherical cup?

I. The volume of the cup is equal to its total surface area internal and external.
II. The volume of the hemisphere is proportional to the cube of the radius.

Tick guessed questions

7.☐ 8.☐ 9.☐ 10.☐ 11.☐ 12.☐ 13.☐

14. What is the total length of the edges of the three-dimensional figure?

I. Volume = 8000 cm^3.

II. It is a cube.

15. What is the length of the fencing required for the rectangular garden?

I. Area of the garden = 100 sq. mts.

II. Length of the diagonal = 10 mts.

Tick guessed questions

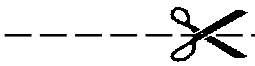
14. ☐ 15. ☐

Feedback Form

Score Sheet

	A	B	C	D	E		A	B	C	D	E
1	O	O	O	O	O	8	O	O	O	O	O
2	O	O	O	O	O	9	O	O	O	O	O
3	O	O	O	O	O	10	O	O	O	O	O
4	O	O	O	O	O	11	O	O	O	O	O
5	O	O	O	O	O	12	O	O	O	O	O
6	O	O	O	O	O	13	O	O	O	O	O
7	O	O	O	O	O	14	O	O	O	O	O
						15	O	O	O	O	O

After completing the test and filling up the boxes below, tear off this strip and give it to your instructor.



Class 7
Quadrilaterals & Polygons
Class Test

Batch | Enrolment No.

1. Total number of questions: **15** 2. Number of questions attempted:

3. Correct answers: 4. Wrong answers: 5. Guessed answers:

Answer Keys

SOLVED EXAMPLES

1-B	2-C	3-D	4-A	5-D	6-B	7-C	8-C
9-D	10-C	11-D	12-B	13-C	14-C	15-D	16-A
17-D	18-A	19-A	20-C				

CLASS TEST

1-D	2-B	3-C	4-C	5-A	6-C	7-B	8-B
9-A	10-B	11-A	12-A	13-A	14-C	15-C	