# 8 | PRACTICE PAPER

[Time Allowed: 3 Hours] [Maximum Marks: 80]

General Instructions: As given in Practice Paper 1.

## Part – A

### SECTION – I

1. If $n$ is an even natural number, then the largest natural number by which $n(n + 1)(n + 2)$ is divisible is

   (a) 24 (b) 42 (c) 18 (d) 16

2. Let $p(x) = 3x^2 - 7x + 4$. $k$ is an integer such that $p(k) = 0$. Then $k =$

   (a) $-1$ (b) 1 (c) 2 (d) 3

   OR

   The discriminant of the quadratic equation $13\sqrt{3}x^2 + 10x + \sqrt{3} = 0$ is

   (a) 65 (b) 56 (c) 26 (d) $-56$

3. A straight line that touches the circle at a single point is called a

   (a) secant to a circle (b) chord to a circle

   (c) radius of the circle (d) tangent to a circle

4. The radius of the circle which passes through the origin, (0, 4) and (4, 0) is

   (a) $2\sqrt{2}$ units (b) $\sqrt{2}$ units

   (c) $3\sqrt{2}$ units (d) $\frac{1}{2}$ units

   OR

   The distance between the points A(3,–5) and P(0, –7) is

   (a) $2\sqrt{13}$ units (b) $\sqrt{2}$ units

   (c) $\sqrt{13}$ units (d) $\frac{\sqrt{13}}{2}$ units

5. The midpoint of the line joining $(3a, 4)$ and $(-2, 2b)$ is $(2, 2a + 2)$. Then values of $a$ and $b$ are

   (a) $a = 4, b = 2$ (b) $a = 4, b = 4$

   (c) $a = 2, b = 4$ (d) $a = 2, b = 2$

6. The mean of 16 observations is 16. If one observation 16 is deleted and three observations 5, 5 and 6 included, then the mean of the final observation is

   (a) 14.22 (b) 22.14 (c) 16.42 (d) 18.56

7. Solving for $x$ and $y$:

   $2x = 5y + 4$

   $3x - 2y + 16 = 0$, we get $x$ and $y$ as

   (a) $x = -4, y = -4$ (b) $x = -8, y = -4$

   (c) $x = 8, y = 4$ (d) $x = -4, y = -8$

8. If $\sec 4A = \text{cosec}(A - 20°)$, where 4A is acute and $A > 20°$, then $3A =$

   (a) 36° (b) 76° (c) 66° (d) 24°

   OR

   If $\frac{\cos^2\theta}{\cot^2\theta - \cos^2\theta} = 3$, then $\theta =$ ($\theta$ : is acute)

   (a) 0° (b) 60° (c) 30° (d) 90°

9. If $(1 + \cos A)(1 - \cos A) = \frac{3}{4}$, find the value of sec A.

10. A child has a die whose six faces show the number as given below:

    1, 2, 2, 3, 4, 6

    The die is thrown once. Find the probability of getting 2.

11. If the sum of roots of equation $3x^2 - (3k - 2)x - (k - 6) = 0$ is equal to the product of its roots, then find $k$.

12. The second term of an AP is $(x - y)$ and 5th term is $(x + y)$, find its first term.

OR

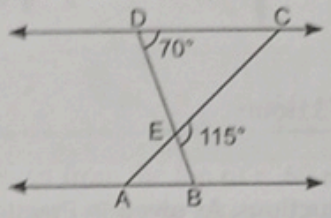
Find the sum of first five multiples of 7.

13. If $\alpha$ and $\beta$ are zeroes of a polynomial $x^2 + 6x + 9$, then form a polynomial whose zeroes are $-\alpha$ and $-\beta$.

14. Write whether $\frac{2\sqrt{45} + 3\sqrt{20}}{2\sqrt{5}}$ on simplification gives an irrational or a rational number.

15. If P(1, 2), Q(4, 6), R(5, 7) and S($a$, $b$) are the vertices of a parallelogram PQRS, then find the value of $a$ and $b$.

16. In the figure $\Delta EDC \sim \Delta EBA$, $\angle BEC = 115^\circ$ and $\angle EDC = 70^\circ$. Find $\angle DEC$,




OR

Let $\Delta ABC \sim \Delta DEF$, ar($\Delta ABC$) = 169 cm$^2$ and ar($\Delta DEF$) = 121 cm$^2$. If AB = 26 cm, then find DE.

## SECTION – II

17. **Case Study – 1**

**FARM HOUSE**

Mr. Gopal Rana took voluntary retirement from his job. After the retirement he purchased a piece of land near Rishikesh and built a farm house. His son Ashok studies in a school in Dehradoon and stays in hostel. During summer vacation, Ashok is back home and staying with his parents. During a general discussion Mr Gopal told Ashok that he purchased cows and hen's and invested ₹ 5,40,000 one cow cost him ₹ 50,000 and cost of one hen is ₹ 200.

Each cow give 10 kg of milk per day and on the average one egg per day obtained from each hen. Milk sells ₹ 90 per kg and selling price of one egg is ₹ 10. By selling milk and eggs he gets ₹ 11000 per day.

($a$) If $x$ is number of cows and $y$ is number of hens. then represent the situation algebraically.

($i$) $x + y = 540000$
$90x + 10y = 11000$

($ii$) $50000x + 200y = 540000$
$90x + 10y = 1000$

($iii$) $50000x + 200y = 540000$
$900x + y = 11000$

($iv$) $50000x + 200y = 540000$
$900x + 10y = 11000$

($b$) Total number of cows and cattle is

($i$) 200 ($ii$) 210
($iii$) 220 ($iv$) 240

($c$) Total number of legs of cows and hens is

($i$) 400 ($ii$) 220
($iii$) 420 ($iv$) 440

($d$) A doctor visits the farm house every month to check the animals.

He charges ₹ 50 per cow and ₹ 5 per hen

Total fees of doctor for each visit is

($i$) ₹ 500 ($ii$) ₹ 1000
($iii$) ₹ 1500 ($iv$) ₹ 2000

($e$) For what value of $p$, the system of equations $2x + 3y - 14 = 0$ and $5x - py - 14 = 0$ will not have a unique solution?

($i$) 6 ($ii$) 7
($iii$) $\frac{-6}{5}$ ($iv$) $\frac{-15}{2}$

18. **Case Study – 2**

**ENJOY SWEETS**

Four friends Kabeer, Swastik, Poshak and Aakrit decided to distribute sweets among the residents of Jhugi Zhopri cluster on new year. Kabeer bought 120 *Rasgullas*, Swastik bought 168 *cookies*, Poshak bought 288 *Rasmalai* and Aakrit bought 364 *barfis*. They wanted to distribute sweets to maximum number of people but wish to give the same number and same set of sweets to each person.

($a$) Find the number of sweets in each set

($i$) 6 ($ii$) 4
($iii$) 5 ($iv$) 7

(*b*) How many people got the sweets?

(*i*) 250 (*ii*) 240

(*iii*) 235 (*iv*) 1225

(*c*) If one set of *rasgulla* costs ₹ 40 then how much money was spent by Kabeer?

(*i*) ₹ 1000 (*ii*) ₹ 1100

(*iii*) ₹ 1200 (*iv*) ₹ 1440

(*d*) If one set of *barfi* costs ₹ 20 then how much money was spent by Aakrit?

(*i*) ₹ 2000 (*ii*) ₹ 1880

(*iii*) ₹ 1840 (*iv*) ₹ 1820

(*e*) Who distributed sweets to more number of people as compared to others?

(*i*) Kabeer (*ii*) Swastik

(*iii*) Poshak (*iv*) Aakrit

**19. Case Study – 3**

**LUCKY NUMBER**

Agarima organised a stall to play 'Lucky Number' at the school fest. She kept a ticket of ₹ 20 to play the game. She will give coin to the player. On tossing the coin if head appears, Agarima will throw a die and player will get the money equivalent to 5 times of the number appearing on the die. If tail appears, player losses the game.

(*a*) Total number of possible outcomes are

(*i*) 5 (*ii*) 6

(*iii*) 7 (*iv*) 8

(*b*) If a playes get a head and on die there is number 2. How much money he will lose or win (count the money paid to play the game)

(*i*) ₹ 20 (*ii*) ₹ 10

(*iii*) ₹ 5 (*iv*) ₹ 0

(*c*) What is probability of getting ₹ 30 on throwing the die?

(*i*) $\frac{5}{6}$ (*ii*) $\frac{2}{3}$

(*iii*) $\frac{1}{7}$ (*iv*) $\frac{3}{7}$

(*d*) What is the probability of lossing the game?

(*i*) $\frac{1}{7}$ (*ii*) $\frac{2}{7}$

(*iii*) $\frac{3}{7}$ (*iv*) 1

(*e*) What is the probability of getting at least ₹ 5 (Excluding the cost of ticket)?

(*i*) $\frac{4}{7}$ (*ii*) $\frac{5}{7}$

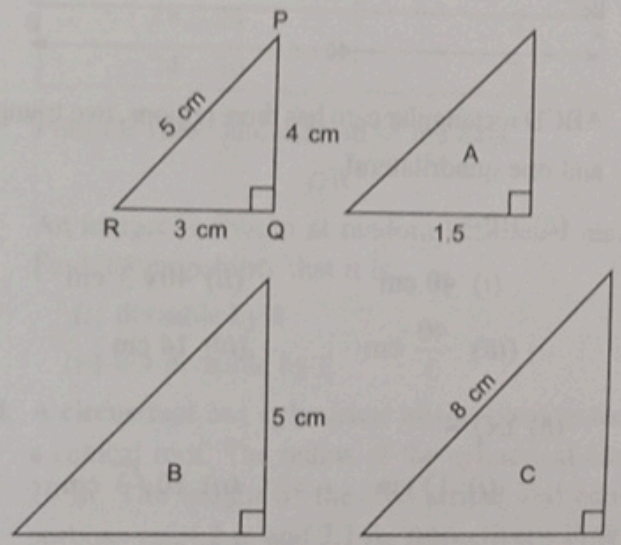
(*iii*) $\frac{6}{7}$ (*iv*) $\frac{1}{7}$

**20. Case Study – 4**

**RATIO OF THE SIDES OF SIMILAR TRIANGLE**

A triangle PQR with sides 3 cm, 4 cm and 5 cm is shown.

Triangle A, triangle B and triangle C are all similar to triangle ΔPQR.




(*a*) Which ratio can be used to determine the base of triangle B?

(*i*) 5 : 3 (*ii*) 3 : 4

(*iii*) 4 : 5 (*iv*) 5 : 5

(*b*) Which ratio can be used to determine the hypotenuse of triangle B?

(*i*) 5 : 4 (*ii*) 5 : 3

(*iii*) 3 : 4 (*iv*) 4 : 4

(*c*) Which ratio can be used to determine the hypotenuse of triangle A?

(*i*) 5 : 4 (*ii*) 4 : 3

(*iii*) 5 : 3 (*iv*) 4 : 5

(*d*) The unknown lengths of triangle A are

(*i*) 2 cm, 2 cm (*ii*) 2.5 cm, 2 cm

(*iii*) 2.5 cm, 2.5 cm (*iv*) 1 cm, 2 cm

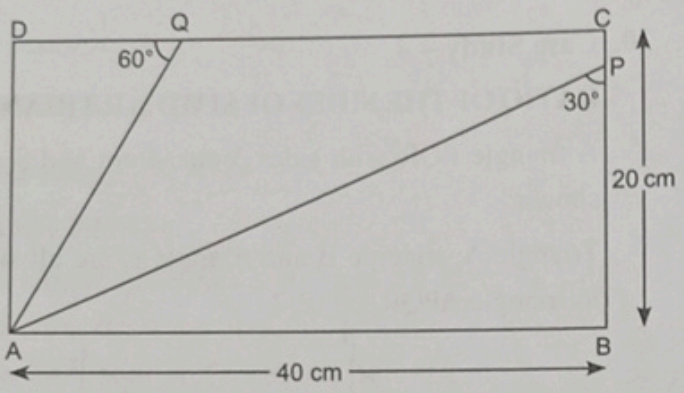
(*e*) The unknown length of triangle C are

(*i*) 6.4 cm, 4.8 cm (*ii*) 6.8 cm, 4.4 cm

(*iii*) 6 cm, 2.4 cm (*iv*) 4 cm, 2 cm

**21. Case Study – 5**

**RECTANGULAR CARD**




ABCD rectangular card has three regions, two triangles and one quadrilateral.

(*a*) BP =

(*i*) 40 cm (*ii*) $40\sqrt{3}$ cm

(*iii*) $\frac{40}{3}$ cm (*iv*) 14 cm

(*b*) DQ =

(*i*) 13 cm (*ii*) $20\sqrt{3}$ cm

(*iii*) $\frac{20}{\sqrt{3}}$ cm (*iv*) 20 cm

(*c*) AQ =

(*i*) $\sqrt{3}$ cm (*ii*) $\frac{40}{\sqrt{3}}$ cm

(*iii*) 40 cm (*iv*) $40\sqrt{3}$ cm

(*d*) AP =

(*i*) 15 cm (*ii*) 20 cm

(*iii*) 40 cm (*iv*) 80 cm

(*e*) AP + AQ = (Use $\sqrt{3} = 1.73$)

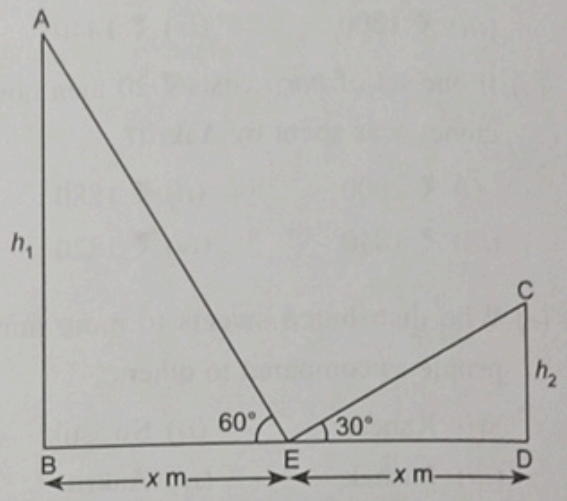
(*i*) 103.12 cm (*ii*) 80 cm

(*iii*) 40 cm (*iv*) 62.13 cm

**22. Case Study – 6**

**TOP FLOOR**

Two towers of different heights are standing on opposite side of a road. The windows, of the top floors of both the tower subtends angle 60° and 30° in the middle of the road.




AB is tower of height $h_1$ and CD is tower of height $h_2$ and point E is in the middle of road, such that BE = DE = $x$ m.

(*a*) height $h_1$ =

(*i*) $x$ m (*ii*) $h_2$ m

(*iii*) $\sqrt{3}x$ m (*iv*) $\frac{x}{\sqrt{3}}$ m

(*b*) height $h_2$ =

(*i*) $x$ m (*ii*) $h_1$ m

(*iii*) $\sqrt{3}x$ m (*iv*) $\frac{x}{\sqrt{3}}$ m

(*c*) $h_1 : h_2$ =

(*i*) 2 : 1 (*ii*) 1 : 2

(*iii*) 1 : 3 (*iv*) 3 : 1

(*d*) AE : CE =

(*i*) $2\sqrt{3} : 1$ (*ii*) $\sqrt{3} : 1$

(*iii*) $\sqrt{3} : 2$ (*iv*) 2 : 1

(*e*) BE : DE =

(*i*) 1 : 1 (*ii*) 2 : 1

(*iii*) 1 : 2 (*iv*) $\sqrt{3} : 1$

Part – B

## SECTION – III

23. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue marbles.

24. Evaluate: $\dfrac{\tan^2 60^\circ + 4\sin^2 45^\circ + 3\sec^2 30^\circ + 5\cos^2 90^\circ}{\text{cosec } 30^\circ + \sec 60^\circ - \cot^2 30^\circ}$

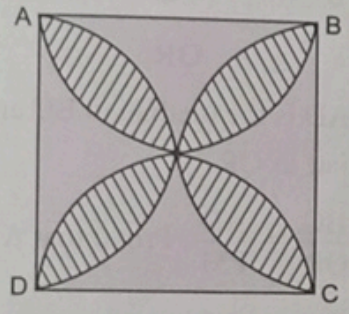
OR

Prove that

$(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

25. Find the area of the shaded design in the given figure, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter.

(Use $\pi = 3.14$)

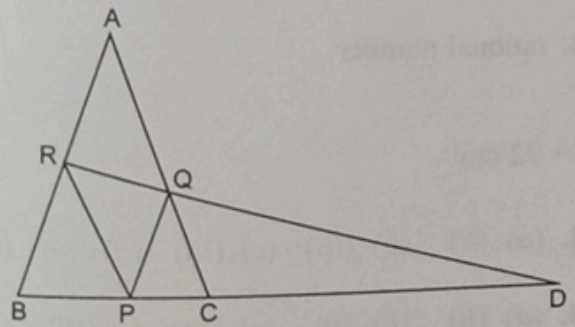



OR

The volume of a vessel in the form of a right circular cylinder is 448 $\pi$ cm$^3$ and its height is 7 cm. Find the radius of its base.

26. If the sum of first 7 terms of AP is 49 and that of 17 terms is 289, find the sum of first $n$ terms.

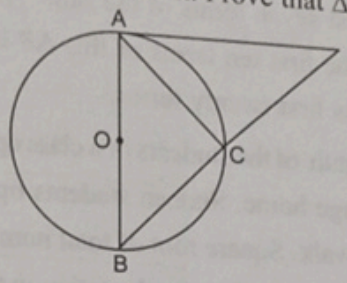
27. In the given figure, PQ || BA and PR || CA. If PD = 12 cm, find BD × CD.




OR

If one diagonal of a trapezium divides the other diagonal in the ratio 1 : 3. Prove that one of the parallel sides is three times the other.

28. In the figure, AB is diameter, PA is tangent to the circle and PCB is secant. Prove that $\Delta BCA \sim \Delta ACP$.




29. In a class test, marks scored by students are given in the following frequency distribution:

| Marks | Number of students |
|---|---|
| 0 – 6 | 1 |
| 6 – 12 | 4 |
| 12 – 18 | 9 |
| 18 – 24 | 3 |
| 24 – 30 | 3 |

Find the mean and median of the data

OR

An integer is chosen at random between 1 and 90. Find the probability that it is:

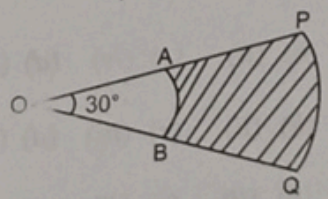
(*i*) divisible by 8

(*ii*) not divisible by 8

30. A circus tent has cylindrical shape surmounted by a conical roof. The radius of the cylindrical base is 20 m. The height of the cylindrical and conical portions are 4.2 m and 2.1 m, respectively. Find the volume of the tent.

OR

In figure, PQ and AB are respectively the arcs of two concentric circles of radii 7 cm and 3.5 cm and centre O. If $\angle POQ = 30^\circ$, then find the area of the shaded region. (Use $\pi = \frac{22}{7}$)



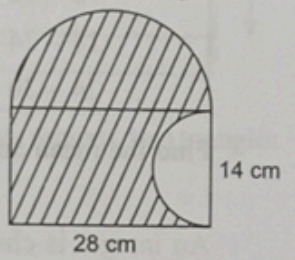

31. Find the area of a parallelogram ABCD, if three of its vertices are A(2, 4), B($2 + \sqrt{3}$, 5) and C(2, 6).

32. Solve the following system of linear equations graphically $x - y = 1$ and $2x + y = 8$. Shade the area bounded by these two lines and the $y$-axis

33. The sum of the first five terms of an AP and the sum of the first seven terms of the same AP is 167. If the sum of the first ten terms of this AP is 235, find the sum of its first twenty terms.

34. Three eighth of the students of a class opted for visiting and old age home. Sixteen students opted for having a nature walk. Square root of total number of students in the class opted for tree plantation in the school. The number of students who visited an old age home is same as the number of students who went for a nature walk and did tree plantation. Find the total number of student.

35. The length and breadth of a rectangular piece of paper are 28 cm and 14 cm respectively. A semi-circular portion is cut off from the breadth's side and a semi-circular portion is added on length's side, as shown in figure. Find the area of the shaded region. [Use $\pi = \frac{22}{7}$]

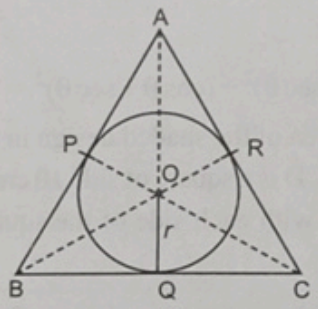



36. In the given figure, the sides AB, BC and CA of $\Delta ABC$ touch a circle with centre O and radius $r$ at P, Q and R respectively.

Prove that:

(*i*) $AB + CQ = AC + BQ$

(*ii*) Area $(\Delta ABC) = \frac{1}{2}$ (perimeter of $\Delta ABC$) $\times r$




**OR**

In $\Delta ABC$, AD is the median to BC and in $\Delta PQR$, PM is the median to QR.

If $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AD}{PM}$, Prove that $\Delta ABC \cong \Delta PQR$

## ANSWERS