



Delhi Public School, Howrah

PERIODIC ASSESSMENT-I(2024-2025)

Class-X

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Mathematics(Code No-041)

Time: 1 hr 30 min

F.M. 40

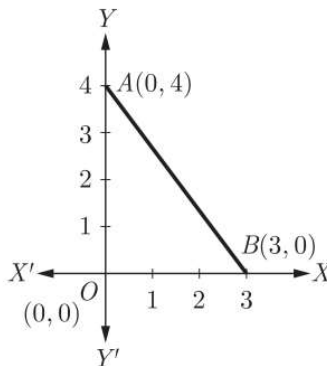
General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 9 MCQs carrying 1 mark each.
3. Section B has 2 questions carrying 02 marks each.
4. Section C has 3 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. Section E has 2 case based integrated units of assessment (04 marks each) with subpartsof the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 1 Q of 5 marks, 1 Q of 3marks and 1 Q of 2 marks has been provided. An internal choice has beenprovided in the 2marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

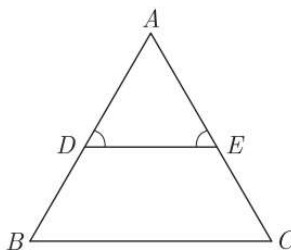
Section A

Section A consists of 9 questions of 1 mark each.

1. X and Y are two positive integers such that $X = p^3q$ and $Y = (pq)^2$, where p,q are prime numbers.The $LCM(X, Y)$ is
 (a) pq (b) p^2q^2 (c) p^3q^2 (d) p^5q^3
2. If $x=a$, $y=b$ is the solution of the equations $x-y=2$ and $x+y=4$, then the values of a and b are, respectively
 (a) 3 and 5 (b) 5 and 3 (c) 3 and 1 (d) -1 and -3
3. For which value(s) of p, will the lines represented by $3x - y - 5 = 0$, $6x - 2y - p = 0$ be parallel?
 (a) All real number except 10 (b) 10 (c) $\frac{5}{2}$ (d) $\frac{1}{2}$
4. The perimeter of the ΔAOB shown in the figure with vertices $(0, 4)$, $(0, 0)$ and $(3, 0)$ is

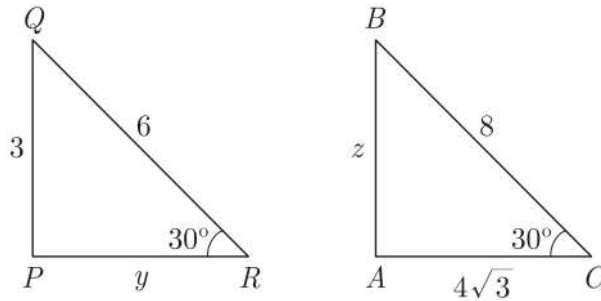


- (a) 5 units (b) 12 units (c) 11 units (d) $7 + \sqrt{5}$ units
5. In the given figure, $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, then ΔBAC is

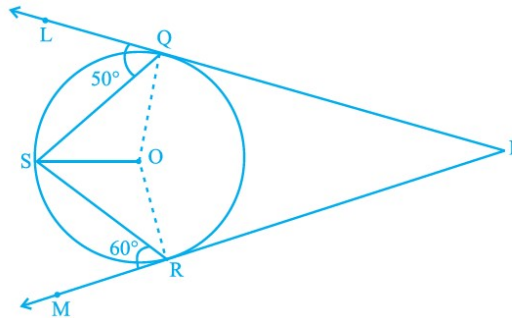


- (a) isosceles triangle (b) scalene triangle (c) equilateral triangle (d) right angle triangle

6. In the given figure, $\Delta ABC \sim \Delta PQR$. The value of $y+z$ will be



- (a) $2\sqrt{2} + 3$ (b) $3\sqrt{3} + 4$ (c) $3\sqrt{2} + 1$ (d) $2\sqrt{3} + 2$
7. In figure, PQL and PRM are tangents to the circle with centre O at the points Q and R respectively and S is a point on the circle such that $\angle SQL = 50^\circ$ and $\angle SRM = 60^\circ$. Then the measure of $\angle QSR$ is



- (a) 110° (b) 70° (c) 10° (d) 120°
8. If the roots of the quadratic equation $(m^2 + n^2)x^2 - 2(mp + nq)x + p^2 + q^2 = 0$ are equal, then which of the following is true?
 (a) $mp = nq$ (b) $mq = np$ (c) $mn = pq$ (d) $mq = \sqrt{np}$

ASSERTION REASONING QUESTIONS

In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 c) Assertion (A) is true but reason (R) is false.
 d) Assertion (A) is false but reason (R) is true.
9. **Assertion(A)** : If the zeroes of the polynomial $3x^2 + (2k + 1)x - 9$ are equal in magnitude but opposite in sign, then the value of k is $-\frac{1}{2}$.

Reason (R) : The sum of zeroes of the quadratic polynomial $ax^2 + bx + c, a \neq 0$, is $-\frac{b}{a}$.

SECTION B

Section B consists of 2 questions of 2 marks each.

10. Find a quadratic polynomial whose zeroes are $\frac{3-\sqrt{5}}{5}, \frac{3+\sqrt{5}}{5}$.
11. (a) Find the ratio in which P(4,m) divides the line segment joining the points A(2,3) and B(6,-3). Hence find the value of m.

OR

(b) Find the ratio in which y-axis divides the line segment joining the points (6,-4) and (-2,-7). Also find the point of intersection of the line with y-axis.

SECTION C

Section C consists of 3 questions of 3 marks each

12. Prove that $\sqrt{5}$ is an irrational number.
13. a) Prove that a parallelogram circumscribing a circle is a rhombus.

OR

b) If a, b, c are the sides of a right triangle where c is hypotenuse, prove that the radius r of the circle which touches the sides of the triangle is given by $r = \frac{a+b-c}{2}$.

14. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.

SECTION D

Section D consists of 2 questions of 5 marks each

15. Draw the graphs of the equations $3x + 2y = 12$ and $3x - y = -6$ on graph paper. Shade the region bounded by the graphs with x -axis and find its area.
16. (a) A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of stream.

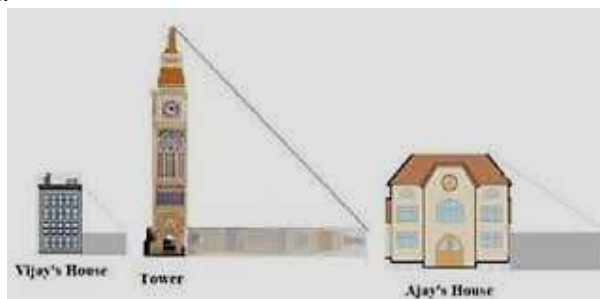
OR

(b) Two water taps together can fill a tank in $1\frac{7}{8}$ hours. The tap of larger diameter takes 2 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

SECTION E

17. Case Study I:

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.



Based on the above information, answer the following questions:

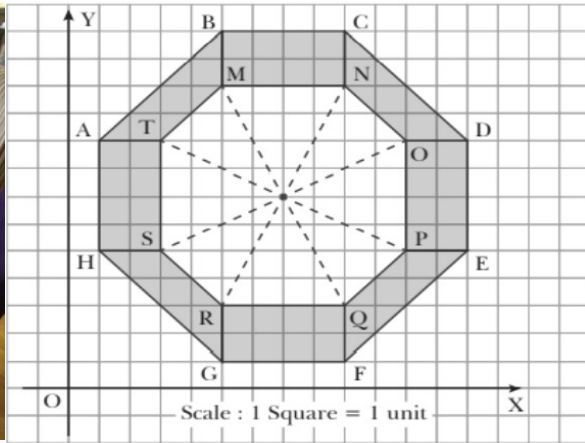
- (i) What is the height of the tower? 1
(ii) What is the height of Ajay's house? 1
(iii) (a) When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's house? 2

OR

(b) When the tower casts a shadow of 40m, same time what will be the length of the shadow of Vijay's house? 2

18. Case Study II:

To manage space in the rooms effectively, many a times octagonal tables are used. Below is an image of an octagonal table and the cross-section of the top of the table.



Based on the above information, answer the following questions:

- (i) What are the coordinates of the points H and G respectively? 1
- (ii) What are the coordinates of the midpoint of line segment joining points M and Q? 1
- (iii)(a) What is the distance between the points A and B? 2

OR

- (b) What is the distance between the points G and H? 2