Bombay Scottish School, Mahim
ASSESSMENT 3
MATHEMATICS

Grade	: 10	Max. Marks	: 40
Date	: 17.01.2022	Writing Duration	: 1 hr 30 mins
Session	: 1	No of Questions	: 05

Time allowed: One and a half hours
Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during the first 10 minutes.
This time is to be spent in reading the question paper.
The time given at the head of this Paper is the time allowed for writing the answers.

Read the instructions carefully.

1. Solve the questions on loose ruled A4 size sheets of paper.
2. Scan clear images of all answer sheets.
3. Each scanned image should have your Name, Grade, Section, Roll No.

---

*Attempt **all** questions from **Section A** and **any three** questions from **Section B**.*
The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A

*(Attempt **all** questions from this Section.)*

Question 1

Choose the correct answers to the questions from the given options. (Do not copy the question,write the correct answer only.) [10]

i) If the lines 2x +3y = 5 and ax -6y = 7 are parallel , then the value of a is

a) $\frac{-1}{4}$

b) 4

c) $\frac{1}{4}$

d) -4

ii) If $0^0 \leq A \leq 90^0$ and $4\sin^2 A - 3 = 0$, then the value of A is

a) 45^0

b) 90^0

c) 60^0

d) 30^0

iii) The total surface area of a cone whose slant height is $\frac{l}{2}$ and radius 2r is

a) πrl

b) πr(l + 4r)

c) 2πr(l + 4r)

d) 2πr(l + r)

iv) $\frac{(1 + tan^2 A)\ cot A}{cosec^2 A}$ is equal to

a) tan A

b) sec A

c) cot A

d) cosec A

v) If the point (5,6) on reflection in a line is mapped to (-5,6), then the equation of the mirror line is

a) y = 0

b) x = 5

c) y = 5

d) x = 0

vi) The midpoint of the line segment joining the points P(5,-3) and Q(-1,7) is

a) (2,2)

b) (-3,2)

c) (-2,2)

d) (3,2)

vii) If the inclination of the slope of a line joining the points (x,-3) and (-1,4) is 45^0 , then the value of x is

a) -2

b) 8

c) 2

d) -8

viii) The slope of a line perpendicular to the line 3x + 4y = 12 is

a) $\frac{3}{4}$

b) $\frac{-4}{3}$

c) $\frac{-3}{4}$

d) $\frac{4}{3}$

ix) If a cylindrical container with internal radius of its base 10cm, contains water up to a height of 7cm then the area of the wet surface of the container is

a) 700π

b) 340π

c) 240π

d) 140π

x) The reflection of point A(-2,0) in the origin is

a) (0,-2)

b) (2,0)

c) (-2,0)

d) (0,2)

SECTION B

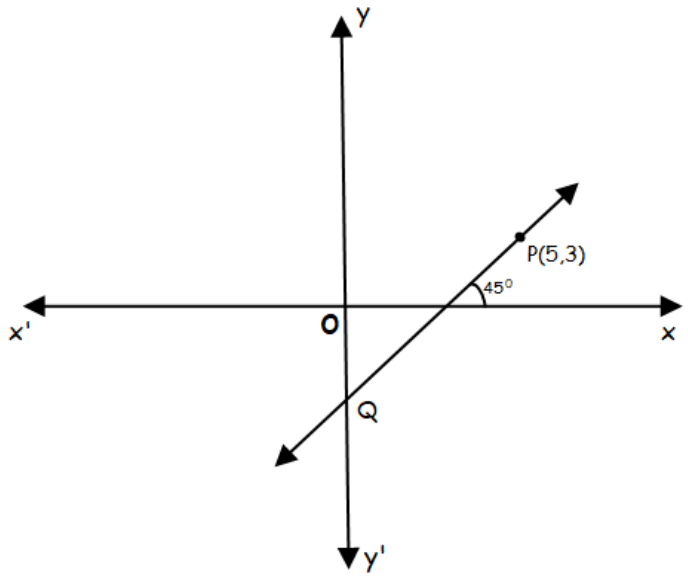
*(Attempt **any three** questions from this Section.)*

Question 2

a) A(5,x), B(-4, 3) and C(y,-2) are the vertices of the triangle ABC whose centroid is the origin. Calculate the values of x and y. [2]

b) If A(-2,-5) , B(2,3) and C(8,a) are collinear. Find the value of a. [2]

c) In the figure given below,the line through P(5,3) intersects y-axis at Q.



i) Write the slope of the line.
ii) Write the equation of the line.
iii) Find the coordinates of Q. [3]

d) Prove the following:

$$\frac{\sin A}{1-\cot A} + \frac{\cos A}{1-\tan A} = \cos A + \sin A$$ [3]

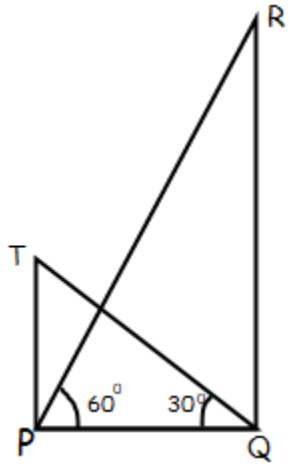
Question 3

a) The volume of a cone with radius 6 cm is 264 cm^3. Find its height.
(Take **Π** = $\frac{22}{7}$) [2]

b) The vertices of a triangle are A(10,4) , B(4,-9) and C(-2,-1). Find the equation of the altitude through A. [2]

c) Use graph paper for this question. Take 2cm = 1 unit on both the axes.
Plot points O(0,0) ,A(-4,4) , B(-3,0) and C (0,-3)
i) Reflect points A and B on the y-axis. Name them as A′ and B′ respectively and write their coordinates.
ii) Name the figure OABCB′A′.
iii) Find the area of the figure formed. [3]

d) In the figure given below, the angle of elevation from a point P to the top of a tower QR ,50m high is 60^0 and that of the tower PT from a point Q is 30^0. Find the height of the tower PT correct to the nearest metre. [3]



Question 4

a) Write down the gradient and the intercept on the y-axis of the line $3y + 2x = 12$ [2]

b) A(-1,0) , B(1,3) and D(3,5) are vertices of a parallelogram ABCD.Find the coordinates of vertex C. [2]

c) Point P(3,-5) is reflected to point P′ in the x-axis. Also, point P on reflection in the line x = -1 is mapped as P′′
i) Write the coordinates of P′ and P′′.
ii) Find the ratio in which the line segment P′ P′′ is divided by the y-axis. [3]

d) Prove the following:

$$\sqrt{\frac{1-\cos A}{1+\cos A}} = \operatorname{cosec} A - \cot A$$ [3]

Question 5

a) M and N are two points on the x-axis and y-axis respectively. P(3,2) divides the line segment MN in the ratio 2 : 3.
Find the coordinates of M and N. [2]

b) Write down the equation of a line parallel to x - 2y + 8 = 0 and passing through the point (1,2) [2]

c) A solid metallic circular cylinder of radius 14cm and height 12cm is melted and recast into small cones of radius 2cm and height 6cm.Find the number of cones formed. [3]

d) An aeroplane is flying horizontally at an altitude of 1500 m above the ground. When it is observed from a point on the ground, the angle of elevation changes from 60^0 to 30^0 in 12 seconds. Find the speed of the plane in km/h. [3]
