

SUMMATIVE ASSESSMENT – II, 2015, MATHEMATICS, CLASS – IX

SOLVED SAMPLE QUESTION PAPER

JST201505

Time allowed: 3 hours

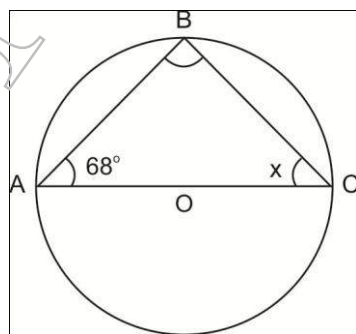
Maximum Marks: 90

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 34 questions divided into 4 sections. A, B, C and D. Section - A comprises of 8 questions of 1 mark each. Section - B comprises of 6 questions of 2 marks each. Section - C comprises of 10 questions of 3 marks each and Section - D comprises of 10 questions of 4 marks each.
- (iii) Question numbers 1 to 8 in section-A are multiple choice questions where you are to select one correct option out of the given four.
- (iv) There is no overall choice. However, internal choice has been provided in 1 question of two marks. 3 questions of three marks each and 2 questions of four marks each. You have to attempt only of the alternatives in all such questions.
- (v) Use of calculator is not permitted.

Section - A

Q.1 The value of x in the given figure is



(a) 22°

(b) 33°

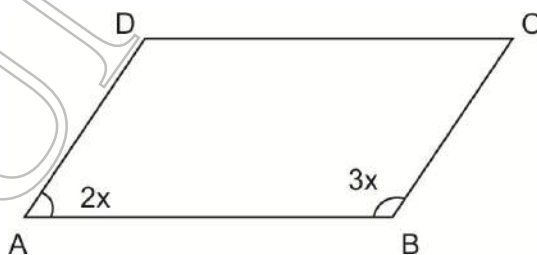
(c) 44°

(d) 68°

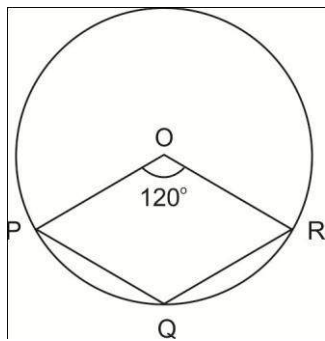
- Q.2 Three angle of a quadrilateral is 60° , 110° and 86° . The fourth angle of quadrilateral is
(a) 104° (b) 124° (c) 94° (d) 84°
- Q.3 Class mark of class interval 90-110 is
(a) 90 (b) 110 (c) 100 (d) None
- Q.4 A die is thrown once. The probability of getting an even no. is
(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{5}$ (d) 2
- Q.5 Which one is solution of eqⁿ $x - 3y = 2$
(a) (4,1) (b) (6,2) (c) (5,1) (d) (0,2)
- Q.6 If the lateral surface area of cube is 1600cm^2 then its edge is
(a) 15cm (b) 18cm (c) 25cm (d) 20cm
- Q.7 If the slant height of a cone is 10 cm and its radius is 6cm, then height of cone is
(a) 9cm (b) 13cm (c) 16cm (d) 8cm
- Q.8 If (2,-3) is solution of eqⁿ $3x - ky = 2$ then the value of K is
(a) -2 (b) $-\frac{2}{3}$ (c) -4 (d) $-\frac{4}{3}$

Section - B

- Q.9 If the total surface area of a hemisphere is $27\pi\text{ cm}^2$, then its diameter is equal to
- Q.10 In the given parallelogram the value of x will be



- Q.11 In the given figure, if $\angle POR$ is 120° , then the value of $\angle PQR$ is



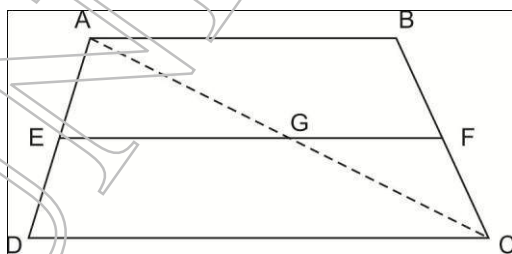
- Q.12 The arithmetic mean of first five odd natural no. is
- Q.13 The probability of an event lies between.....
- Q.14 Write the relation between mean, median and mode.....

Section - C

- Q.15 Draw the graph of $2x + y = 6$ and find the point on x-axis where graph of this eqⁿ cut the x-axis.
- Q.16 Find three solution of the linear equation $2x + 3y = 5$, and check whether (-3, 4) is a solution of the given equation.
- Q.17 In a parallelogram, show that the angle bisectors of two adjacent angles intersect at right angle.

OR

In the given figure, E is the mid-point of side AD of a trapezium ABCD with $AB \parallel CD$. A line through E parallel to AB meets BC in F show that F is the mid-point of BC.

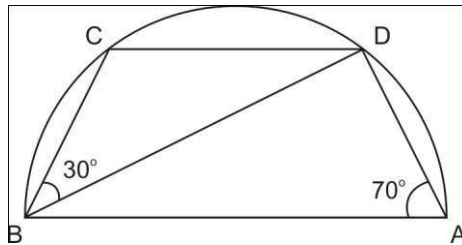


- Q.18 Triangle ABC and DBC are on the same base BC with vertices A and D on opposite sides of BC such that area of $\triangle ABC = \text{area of } \triangle DBC$. Show that BC bisect AD.

Q.19 ABCD is a cyclic quadrilateral BA and CD produced meet at E. Prove that triangle EBC and EDA are equiangular.

OR

In given figure, C and D are points on the



Semi circle described on BA as diameter given $\angle BAD = 70^\circ$, $\angle DBC = 30^\circ$

Calculate $\angle ABD$ and $\angle BDC$.

Q.20 Construct a triangle ABC in which $BC=4.5\text{cm}$, $\angle B = 45^\circ$ and $AB - AC = 2.5\text{cm}$

Q.21 A conical tent is 10m high and the radius of its base is 24m. Calculate its slant height and cost of canvas required to make it at the rate Rs. 70 per m^2 .

Q.22 A sphere, a cylinder and a cone are the same radius and same height. Find the ratio of their curved surfaces.

OR

Volume of a cube is 5832m^3 . Find the cost of painting its total surface area at the rate of Rs. 3.50 per m^2 .

Q.23 A car is going for a long journey of 16 hours starting at 5.00 hours. The speed of the car at different hours is given below.

Time (in hours)	Speed (in km/hr.)
5.00	40
7.00	50
9.00	60

11.00	80
13.00	70
15.00	65
17.00	75
19.00	60
21.00	50

Draw a velocity time graph for the above data.

- Q.24 A coin is tossed 15 times and observed that 11 times head comes up. Find the probability that a tail comes up.

Section - D

- Q.25 The taxi fare in a city is as follow. For the first kilometer, the fare is Rs. 8 for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km. and total fare as Rs. y , write a linear equations for this information and draw its graph.
- Q.26 If the points A (3,5) and B(1,4) lies on the line $ax + by = 7$ find the values of a and b .

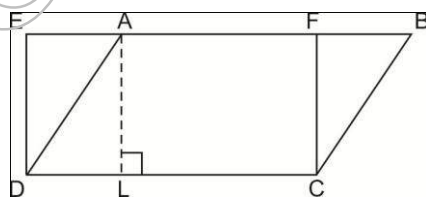
OR

Draw the graph of the equation $-y = 1$ and $2x + y = 8$. Shade the area bounded by these two lines and y -axis. Also determine this area.

- Q.27 ABCD is a parallelogram. AB produced to E so that BE=AB. Prove that ED bisects BC.
- Q.28 In given figure, ABCD is a parallelogram and EFCD is a rectangle. Also $AL \perp DC$ Prove that

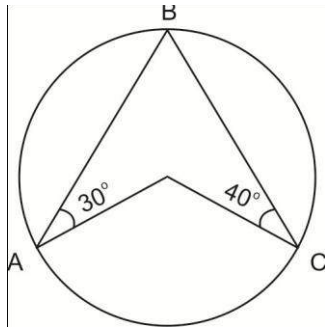
(i) $ar(ABCD) = ar(EFCD)$

(ii) $ar(ABCD) = DC \times AL$



Q.29 Prove that the area of an equilateral triangle is equal to $\frac{\sqrt{3}}{4} a^2$ where a is the side of the triangle.

Q.30 In given figure, calculate the angle $\angle AOC$



Q.31 Construct a $\triangle ABC$ in which $BC=5.6\text{cm}$, $AC-AB=1.6\text{cm}$ and $\angle B = 45^\circ$

Q.32 The mean of the following distribution is 50.

x	frequency
10	17
30	$5a+3$
50	32
70	$7a-11$
90	19

Find the value of a and frequency of 30 and 70.

Q.33 How many planks each of which is 2m long, 2.5 cm broad and 4cm thick can be cut off from a wooden block 6m long, 15cm broad and 40cm thick?

Q.34 An iron pipe 20cm long has exterior diameter equal to 25cm. If the thickness of the pipe is 1 cm. Find the whole surface area of the pipe excluding ends of the pipe.

OR

The diameter of a sphere is decreased by 25% by what percent its curved surface area decreases.

Sample Paper SA -II

Marking Scheme

Section - A

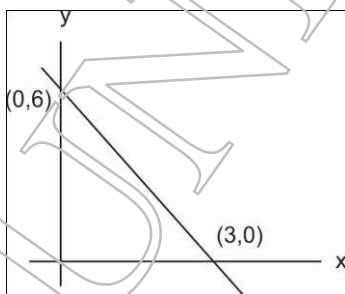
- Q.1 (a)
Q.2 (a)
Q.3 (c)
Q.4 (a)
Q.5 (c)
Q.6 (d)
Q.7 (d)
Q.8 (d)

Section - B

- Q.9 6cm
Q.10 36cm
Q.11 120°
Q.12 5
Q.13 0 and 1, both no. are including.
Q.14 mode = 3 median = 2 mean

Section - C

Q.15



Point on x-axis is (3,0)

Q.16 $2x + 3y = 5$ -----(1)

Put $x = 1, 2, 3, 0, -1, 2$ etc and get value of y .

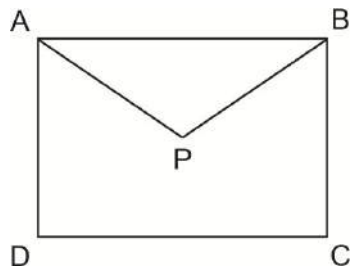
then (x, y) is solⁿ of this eqⁿ

Put $x = -3$ and $y = 4$ in eqⁿ (1) we get

$$-6 + 12 \neq 4$$

So $(-3, 4)$ is not a solution.

Q.17



To prove $\angle APB = 90^\circ$

$$\angle A + \angle B = 180^\circ$$

$$\frac{1}{2}\angle A + \frac{1}{2}\angle B = 90^\circ$$

$$\text{But } \frac{1}{2}\angle A + \frac{1}{2}\angle B + \angle APB = 180^\circ$$

$$90^\circ + \angle APB = 180^\circ$$

$$\Rightarrow \angle APB = 90^\circ$$

OR

Construction : Join AC to intersect EF at G.

Proof $EF \parallel DE$

$EG \parallel DE$

since E is mid point of AD.

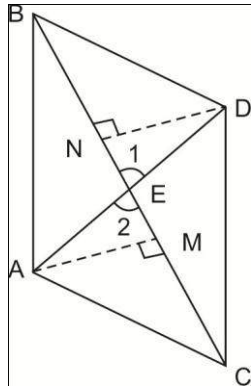
\therefore G is mid point of AC (By converse of mid point theorem)

In $\triangle ABC$ $FG \parallel AB$.

G is mid point of AC

\therefore F is mid point of BC.

Q. 18.



Construction : Join AD. Which intersect BC at E draw $DN \perp BC$ $AM \perp BC$

Proof :

$AM=DN$ (Δ on same base and equal in area so altitude is same)

Now in ΔAEM and DEN

$$\angle 1 = \angle 2$$

$$\angle AME = \angle DNE = 90^\circ$$

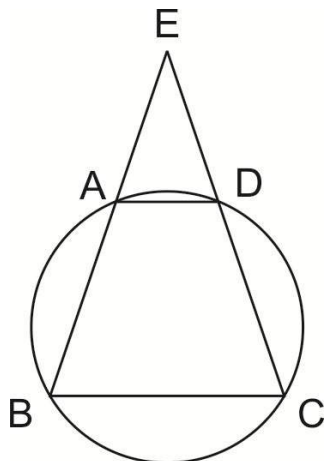
$$AM = DN$$

$$\Delta AEM \cong \Delta DEN$$

$$\text{So } AE = DE$$

$$\Rightarrow BC \text{ bisect } AD$$

Q. 19.



Given ABCD is a cyclic quadrilateral BA and CD produced meet at E.

To prove $\triangle EBC$ and $\triangle EDA$ are equiangular.

Proof : ABCD is a cyclic quad.

$$\therefore \angle BAD + \angle BCD = 180^\circ$$

$$\text{But } \angle BAD + \angle EAD = 180^\circ \text{ (linear pair)}$$

$$\Rightarrow \angle BCD = \angle EAD$$

Similarly $\angle ABC = \angle EDA$

$$\text{and } \angle BEC = \angle AED$$

Hence $\triangle EBC$ and $\triangle EDA$ are equiangular

OR

$$\angle BCD + \angle BAD = 180^\circ \text{ (as ABCD is a cyclic quadrilateral)}$$

$$\angle BCD + 70^\circ = 180^\circ$$

$$\angle BCD = 110^\circ \text{ -----(1)}$$

$$\text{Also } \angle CBD + \angle BCD + \angle BDC = 180^\circ$$

$$30^\circ + 110^\circ + \angle BDC = 180^\circ$$

$$\angle BDC = 40^\circ \text{ Ans.}$$

Since $\angle ADB$ is angle in semi-circle

$$\angle ADB = 90^\circ$$

In $\triangle ABD$

$$\angle ABD + \angle ADB + \angle BAD = 180^\circ$$

$$\angle ABD + 90^\circ + 70^\circ = 180^\circ$$

$$\angle ABD = 20^\circ \text{ Ans}$$

Q.20 Steps of construction

(i) Draw a ray BX and cut off a line segment BC=4.5cm from it

(ii) Construct $\angle XBY = 45^\circ$

(iii) Cut off a line segment BD=2.5cm from BY

(iv) Join CD.

(v) Draw \perp bisector of CD cutting BY at a point A.

(vi) Join AC

So $\triangle ABC$ is the required triangle.

Q.21 $l^2 = r^2 + h^2$

$$l = 26m$$

$$\text{Curved surface area} = \pi r l$$

$$\text{Cost} = 70 \times \pi r l$$

$$= \text{Rs. } 137280$$

Q.22 Let r is radius then height of cone = sphere = cylinder = $2r$

$$\text{So } S_1 = \text{curved surface of sphere} = 4\pi r^2$$

$$S_2 = \text{curved surface of cylinder} = 4\pi r^2$$

$$S_3 = \text{curved surface cone} = \sqrt{5} \pi r^2$$

$$\text{as } l = \sqrt{r^2 + h^2} = \sqrt{r^2 + 4r^2} = \sqrt{5} r \quad \text{ratio : } 4 : 4 : \sqrt{5}$$

OR

$$\text{volume } S^3 = 5832\text{m}^3$$

$$S = 18\text{m}$$

$$\text{Painted area } 6s^2$$

$$= 1944\text{m}^2$$

$$\text{Cost} = 1944 \times 3.5$$

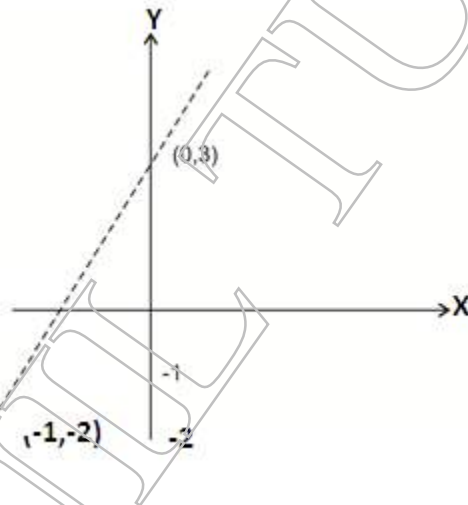
$$= \text{Rs. } 6804$$

Q.23 Check your graph with the help of your teacher/classmates

Q.24 Ans. $\frac{4}{15}$

Q.25 $y = 8 + 5 \times (x - 1)$

$$\Rightarrow y = 5x + 3$$

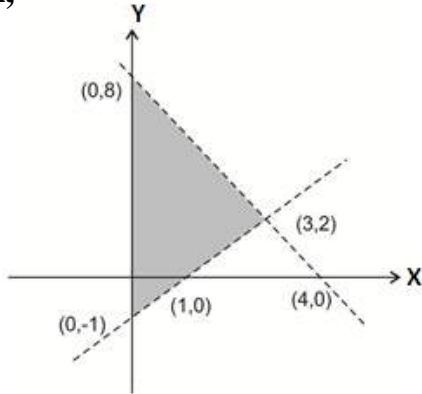


Q.26 $3a + 5b = 7$

$$a + 4b = 7$$

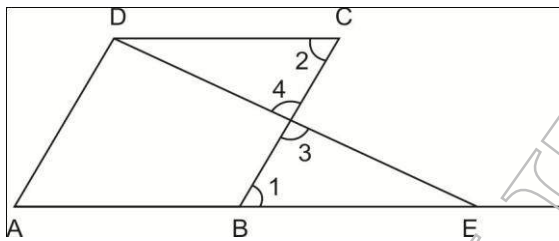
$$a = -1, b = 2$$

Q.26 . OR,



$$\text{Area} = \frac{1}{2} \times 9 \times 3 = 13.5 \text{ sq units.}$$

Q.27



$AB \parallel CD$ and BC transversal

So $\angle 1 = \angle 2$

$\angle 3 = \angle 4$

$AB = CD = BE$

So $\triangle BOE \cong \triangle COD$

$\Rightarrow BO = CO$, O is mid of BC

\Rightarrow ED bisect BC

Q.28 Since parallelogram and rectangle are on same base DC and between same height AL

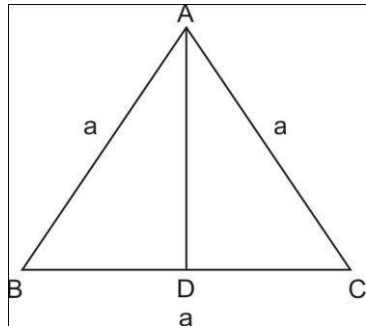
$\text{ar}(\text{ABCD}) = \text{ar}(\text{DEFE})$

So $\text{ar}(\text{ABCD}) = CD \times FC$

$= CD \times AL$ ($AL = FC$ as $ALCF$ is rectangle)

$= DC \times AL$

29.



$$\triangle ABD \cong \triangle ACD$$

$$BD = DC = \frac{a}{2}$$

In $\triangle ADB$

$$AD^2 = a^2 - \left(\frac{a}{2}\right)^2$$

$$AD = \frac{\sqrt{3}}{4} a$$

$$\text{ar } \triangle ABC = \frac{1}{2} BC \times AD = \frac{\sqrt{3}}{4} a^2$$

Q.30 Join OB

the find $\angle ABO = 30^\circ$

and $\angle CBO = 40^\circ$

So $\angle ABC = 70^\circ$

So $\angle AOC = 140^\circ$

Q.31 Steps of const.

(i) Draw $BC=5.6\text{cm}$

(ii) At B make $\angle CBX = 45^\circ$

(iii) Produce XB to X^1 to form line XBX^1

(iv) From ray BX^1 cut off line segment $BD = 1.6\text{cm}$

(v) Join CD

(vi) Draw \perp bisector of CD which cut BX at A.

(vii) Join AC to obtain required $\triangle BAC$

Q.32 $\Sigma fi = 12a + 60$, $\Sigma fixi = 640a + 2800$

$$\bar{x} = \frac{\sum fix_i}{\sum fi}$$

$$50 = \frac{640a + 2800}{12a + 60}$$

a = 5 Ans.

Q.33 number of planks = $\frac{\text{volume of wooden block}}{\text{volume of each plank}} = \frac{600 \times 15 \times 40}{200 \times 2.5 \times 4} = 180$

Q.34 R = 12.5 (External radius)

r = internal radius = (external radius - 1cm) = 11.5cm

h = 20cm

Total surface area = External surface area + Internal surface area = 3168cm²

OR

Given S = $4\pi r^2$

Decreased radius = $\frac{3r}{4}$

then new area = $\frac{9\pi r^2}{4}$

Decreased area = $\frac{7\pi r^2}{4}$

% decrease = 43.75

