
NOTE: - Attempt all questions from Section A and any four questions from Section B. All working, including rough work, must be clearly shown on the same sheet as the rest of the answer. Omission of essential working will result in loss of marks. The intended marks for questions or parts of questions are given in brackets ( ).

SECTION - A (40 MARKS)
Attempt all questions from this Section.

Question 1

a) Factorize : $729\, x^6 - 64\, y^6$ [3]

b) Expand : $\left(\dfrac{5a}{6b} - \dfrac{2b}{5a} - 4\right)^2$ [3]

c) Three circles with centres A, B and C touch each other externally. [4]
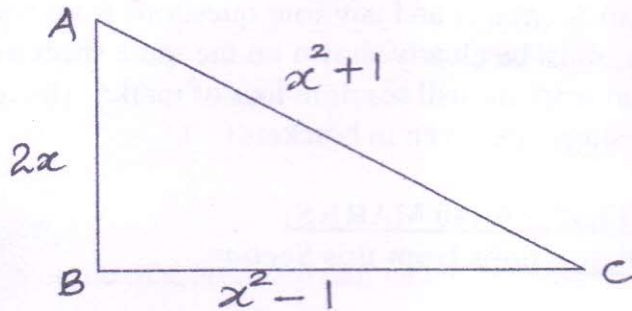   If AB = 47 cm, BC = 53 cm and AC = 36cm. calculate the radii of the circles.
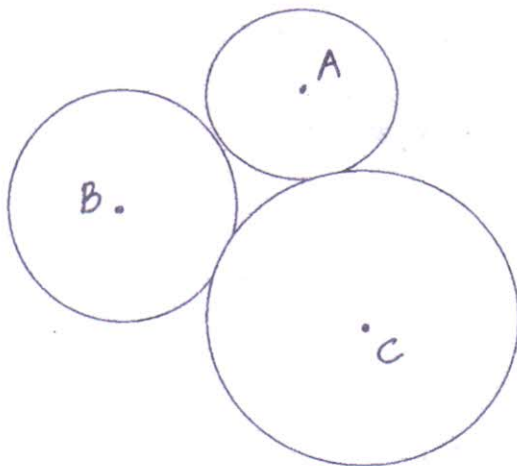
Question 2.

a) Find the value of [3]

$\dfrac{4}{3}\tan^2 30° + \sin^2 60° - 3\cos^2 60° + \dfrac{3}{4}\tan^2 60° - 2\tan^2 45°$

b) Construct a regular hexagon of side 4.4 cm. Inscribe a circle in it and record its radius. [3]

c) Draw a histogram for the following data and determine the mode. [4]

Wt. (in kg)	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69
No. of students	2	8	12	10	6	4

Question 3.

a) If $a + b = 4$ and $a^3 + b^3 = 28$ find $a^2 + b^2$ [3]

b) [3]

In the figure given above AB = $2x$, BC = $x^2 - 1$ and AC = $x^2 + 1$. Show that ABC is a right angled triangle. Hence find the sides of the triangle when $x = 4$.

c) Solve the following simultaneous equations. [4]

$$177\,a - 77\,b = 1847$$
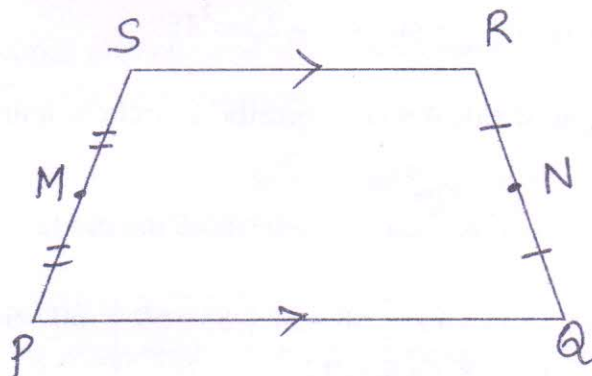$$77a - 177\,b = 947$$

Question 4.

a) The length of one diagonal of a rhombus is 24 cm and its perimeter is 80 cm. Find the area of the rhombus. [3]

b) Calculate the compound interest on Rs.10240 at 12 ½ % p.a. compounded half yearly for one year. [3]

c) M and N are midpoints of non-parallel sides SP and RQ respectively of trapezium PQRS shown below. [4]
Prove that i) MN is parallel to PQ
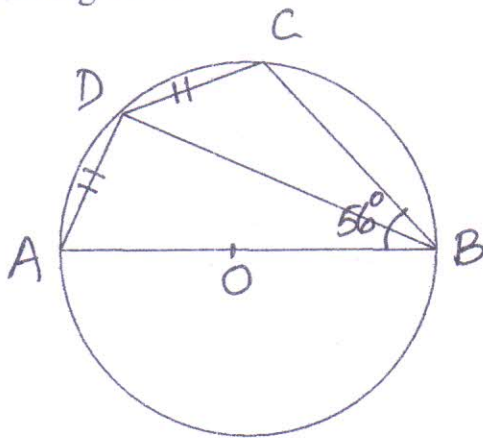
and ii) MN = $\frac{1}{2}$ (PQ + SR)

C) Calculate the mean of the following distribution using step deviation method.   [4]

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	10	9	25	30	16	10

Question 8.

a) Draw a circle of diameter 8 cm. Draw two tangents to this circle such   [3]
   that the angle between the tangents is 45°. Measure and record the length
   of the tangent segments.

b)   [3]

In the figure drawn above, O is the centre of the circle. Chord AD = chord DC
and ∠ABC = 56°. Find i) ∠CBD and ii) ∠DAB.

c) A rectangular garden 10m by 16m is to be surrounded by a concrete walk   [4]
   of uniform width. Given that the area of the walk is 120m^2, find the width
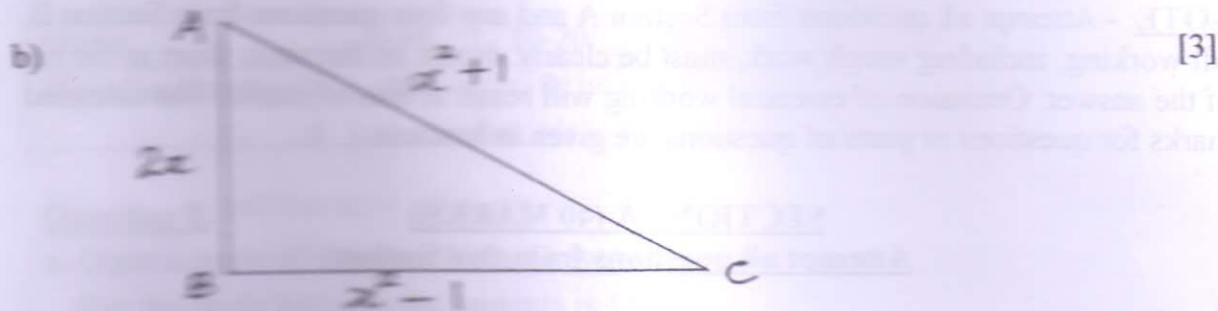   of the walk.

Question 9

a) P is a point whose ordinate and abscissa are same. If Q (7,11) and length   [3]
   PQ =20 cm, find the co-ordinates of P.

b) The mean weight of 30 students of a class is 60.2 kg. Two students of weight   [3]
   50 kg and 67 kg left the class. Find the mean weight of the remaining students.

c) Mr. Mohan takes a loan of one lakh rupees from a Co-operative bank at
   12% per annum compound interest. If he repays Rs.32,000 at the end of the   [4]
   first year and Rs. 59,600 at the end of the second year, find the amount of loan
   outstanding at the beginning of the third year.

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