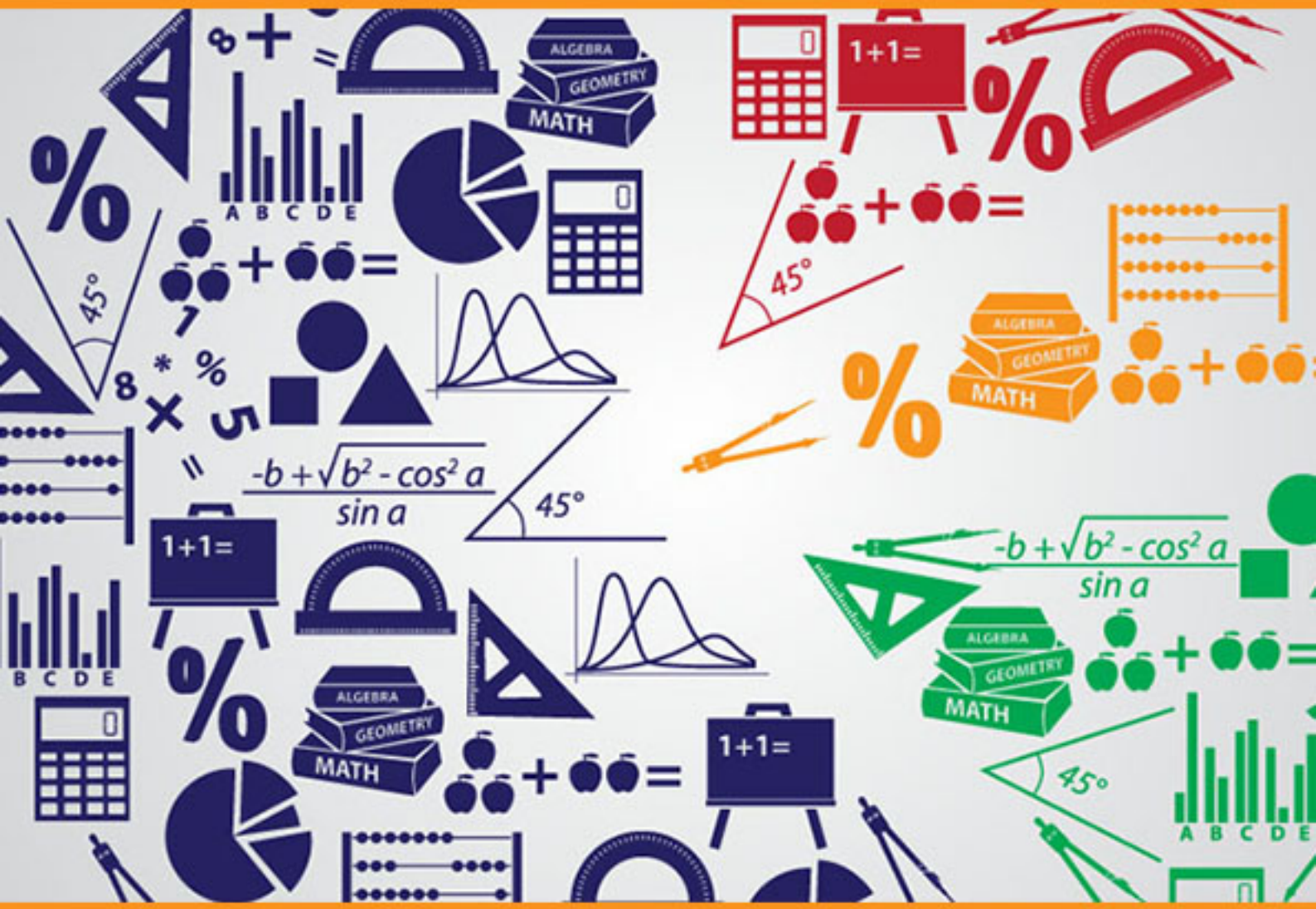
Cbse Class 10

Mathematics SA II

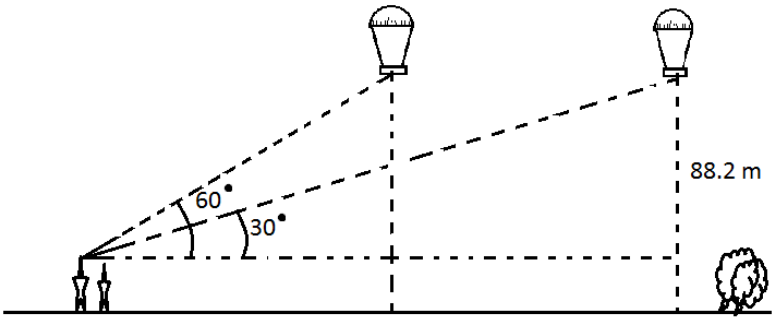


Sample Question Paper

SAMPLE QUESTIONS
MATHEMATICS
SA II (March)
CLASS-X

Multiple Choice type (1 mark) questions	
1.	द्विघात समीकरण $2x^2-kx+k = 0$, के मूल समान हैं। k का मान है: (A) केवल 0 (B) 4 (C) केवल 8 (D) 0, 8 Values of k for which the quadratic equation $2x^2-kx+k = 0$ has equal roots is: (A) 0 only (B) 4 (C) 8 only (D) 0, 8
2.	एक 5सेमी. की त्रिज्या वाले वृत के बिन्दु P पर एक स्पर्श रेखा खींची गई जो कि केन्द्र से खींची गई रेखा को Q पर प्रतिच्छेदित करती है। OQ = 12cm तो PQ की लम्बाई है: (A) 12cm (B) 13cm (C) 8.5cm (D) $\sqrt{119}$cm A tangent PQ at a point of P of a circle of radius 5cm meets a line through the center O at a point Q, such that OQ = 12cm. Length of PQ is: (A) 12cm (B) 13cm (C) 8.5cm (D) $\sqrt{119}$cm
3.	1 से 52 तक संख्या के कार्डों में से एक कार्ड यादृच्छया लिया गया। कार्ड पर एक पूर्ण वर्ग संख्या के आने की प्रायिकता है: (A) $\frac{1}{13}$ (B) $\frac{2}{13}$ (C) $\frac{7}{52}$ (D) $\frac{10}{13}$ A card is drawn from a deck of cards numbered 1 to 52. The probability that the number on the card is a perfect square is: (A) $\frac{1}{13}$ (B) $\frac{2}{13}$ (C) $\frac{7}{52}$ (D) $\frac{10}{13}$
4.	बिन्दु P(2, 3) की x- अक्ष से दूरी है: (A) 2इकाई (B) 3इकाई (C) 1इकाई (D) 5इकाई The distance of the point P(2, 3) from the x-axis is: (A) 2units (B) 3units (C) 1unit (D) 5units
5.	6cm भुजा के वर्ग के अन्तः वृत का क्षेत्रफल है: (A) 36π cm^2 (B) 18π cm^2 (C) 12π cm^2 (D) 9π cm^2 The area of the circle that can be inscribed in a square of side 6cm is: (A) 36π cm^2 (B) 18π cm^2 (C) 12π cm^2 (D) 9π cm^2
Short Answer-I type (2 mark) questions	
1	द्विघात समीकरण $3x^2 - 4\sqrt{3}x+4 = 0$ के मूलों की प्रकृति ज्ञात कीजिए। Find the nature of the roots of the quadratic equation: $3x^2 - 4\sqrt{3}x+4 = 0$
2	k के किस मान के लिए 2k, k+10 तथा 3k+2 समान्तर श्रेणी में है?

	For what value of k are 2k, k+10 and 3k+2 in AP?
3	सिद्ध कीजिए कि वृत के व्यास के छोर बिन्दुओं पर खींचीं गई स्पर्श रेखाएं समान्तर होती हैं। Prove that tangents drawn at the ends of a diameter of a circle are parallel.
4	सिद्ध कीजिए कि एक वृत के परिगत समान्तर चतुर्भुज समचतुर्भुज है। Prove that the parallelogram circumscribing a circle is a rhombus.
5	किसी कारण 132 अच्छे पेनों के साथ 12 खराब पेन मिल गए केवल देखकर यह नहीं बताया जा सकता है कि कोई पेन खराब है या अच्छा । इसमें से एक पेन यादृच्छया से निकाला गया। प्रायिकता ज्ञात कीजिए कि निकाला गया पेन अच्छा पेन है। 12 defective pens are accidently mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.
Short Answer-II type (3 mark) questions	
1	निम्न द्विघाती समीकरण के मूल गुणनखण्ड विधि से ज्ञात कीजिए: $\sqrt{2}x^2 - 7x+5\sqrt{2} = 0$ Find the roots of the following quadratic equation by factorization: $\sqrt{2}x^2 - 7x+5\sqrt{2} = 0$
2	एक समान्तर श्रेणी में प्रथम पद 5, सार्व अन्तर 3 तथा nवां पद 50 है। इस समान्तर श्रेणी में n का मान तथा प्रथम n पदों का योग ज्ञात कीजिए। In an A.P., first term is 5, common difference is 3 and nth term is 50. Find the value of n and sum of its first n terms.
3	एक ठेकेदार ने पार्क में बच्चों के लिए दो फिसलने वाली फिसल पट्टी लगानी है। 5वर्ष से कम आयु के बच्चों के लिए फिसलन पट्टी के सिरे की ऊँचाई 1.5मीटर तथा इसका ग्राउण्ड के साथ झुकाव 30^0 का है। बड़े बच्चों के लिए अधिक ढाल की फिसलन पट्टी लगानी है जिसकी ऊँचाई 3मीटर तथा ग्राउण्ड के साथ झुकाव 60^0 का है। प्रत्येक अवस्था में फिसलन पट्टी की लम्बाई ज्ञात कीजिए। A contractor plans to install two slides for the children to play in a park. For the children below the age of 5years, she prefers to have a slide whose top is at a height of 1.5m, and is inclined at an angle of 30^0 to the ground, whereas for elder children, she wants to have a steep slide at a height of 3m and inclined at an angle of 60^0 to the ground. What should be the length of the slide in each case?
4	12 cm त्रिज्या वाले वृत में एक जीवा केन्द्र पर 120^0 का कोण बनाती है। इस वृतखण्ड का क्षेत्रफल ज्ञात कीजिए। ($\pi = 3.14$ तथा $\sqrt{3} = 1.73$ का प्रयोग कीजिए) A chord of a circle of radius 12cm subtends an angle of 120^0 at the centre. Find the area of the segment of the circle. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)
5	एक सर्कस का तम्बू 3m. की ऊँचाई तक बेलनाकार तथा उससे ऊपर शंक्वाकार है। यदि आधार का व्यास 105m तथा शंक्वाकार भाग की तिरछी ऊँचाई 53m है तो इस टैन्ट को बनाने में प्रयोग में लाई गई कैनवस का क्षेत्रफल ज्ञात कीजिए। A circus tent is cylindrical upto a height of 3m and conical above it. If the diameter of the

	base is 105m and the slant height of the conical part is 53m, find the area of canvas used in making the tent.
Long Answer-I type (4 mark) questions	
1	एक भिन्न का अंश हर से 2 कम है। यदि अंश तथा हर दोनों में 1 जोड़ा जाए तो नई भिन्न तथा मूल भिन्न का योग $\frac{19}{15}$ है तो मूल भिन्न ज्ञात कीजिए। The numerator of a fraction is 2 less than the denominator. If 1 is added to both numerator and denominator, the sum of the new and original fraction is $\frac{19}{15}$. Find the original fraction.
2	एक समान्तर श्रेणी के प्रथम n पदों का योग $S_n = 3n^2 - 4n$ है। समान्तर श्रेणी तथा इसका 12वां पद ज्ञात कीजिए। The sum of the first n terms of an AP is given by $S_n = 3n^2 - 4n$. Determine the AP and the 12th term.
3	एक वृत के परिगत चतुर्भुज की सम्मुख भुजाएं वृत के केन्द्र पर संपूरक कोण अंतरित करती हैं। सिद्ध कीजिए। Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.
4	1.2 m लम्बी लड़की एक गुब्बारे को हवा के साथ क्षैतिज दिशा में 88.2 m की ऊँचाई पर उड़ता देखती है। गुब्बारे का लड़की की आँख पर उन्नयन कोण 60^0 का है। कुछ समय पश्चात् उन्नयन कोण घटकर 30^0 हो जाता है (आकृति देखें)। इस अवधि में गुब्बारे द्वारा कितनी दूरी तय की गई?  A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60^0. After some time, the angle of elevation reduces to 30^0 (see figure). Find the distance travelled by the balloon during the interval.
5	6 cm व्यास का एक गोला पानी वाले बेलनाकार में डाला गया। इस बर्तन का व्यास 12 cm है। यदि गोला पूरी तरह से पानी में डुबाया जाए तो ज्ञात कीजिए कि पानी का स्तर कितना बढ़ जायेगा? A sphere of diameter 6cm is dropped into a cylindrical vessel partly filled with water. The diameter of the vessel is 12cm. If the sphere is completely submerged, how much will the surface of water be raised?
	-o0o0o0o-

Design of Question Paper

Mathematics - Class X

Time : Three hours **Max. Marks : 80**

Weightage and distribution of marks over different dimensions of the question paper shall be as follows:

A. Weightage to content units

S.No.	Content Units	Marks
1.	Number systems	04
2.	Algebra	20
3.	Trigonometry	12
4.	Coordinate Geometry	08
5.	Geometry	16
6.	Mensuration	10
7.	Statistics & Probability	10
	Total	**80**

B Weightage to forms of questions

S.No.	Forms of Questions	Marks of each question	No. of Questions	Total marks
1.	Very Short answer questions (VSA)	01	10	10
2.	Short answer questions-I (SAI)	02	05	10
3.	Short answer questions-II (SAII)	03	10	30
4.	Long answer questions (LA)	06	05	30
	Total		**30**	**80**

C. Scheme of Options

All questions are compulsory. There is no overall choice in the question paper. However, internal choice has been provided in one question of two marks each, three questions of three marks each and two questions of six marks each.

D. Weightage to diffculty level of Questions

S.No.	Estimated difficulty level of questions	Percentage of marks
1.	Easy	15
2.	Average	70
3.	Difficult	15

Based on the above design, separate Sample papers along with their blue print and marking scheme have been included in this document for Board's examination. The design of the question paper will remain the same whereas the blue print based on this design may change.

Mathematics-X

Blue Print I

Form of Questions / Unit	VSA (1 Mark) each	SAI (2 Marks) each	SA II (3 Marks) each	LA (6 Marks) each	Total
Number systems	1(1)	—	3(1)	—	4(2)
Algebra	3(3)	2(1)	9(3)	6(1)	20(8)
Trigonometry	1(1)	2(1)	3(1)	6(1)	12(4)
Coordinate Geometry	—	2(1)	6(2)	—	8(3)
Geometry	2(2)	2(1)	6(2)	6(1)	16(6)
Mensuration	1(1)	—	3(1)	6(1)	10(3)
Statistic and Probability	2(2)	2(1)	—	6(1)	10(4)
Total	**10(10)**	**10(5)**	**30(10)**	**30(5)**	**80(30)**

Sample Question Paper - I

Mathematics - Class X

Time : Three hours **Max.Marks :80**

General Instructions.

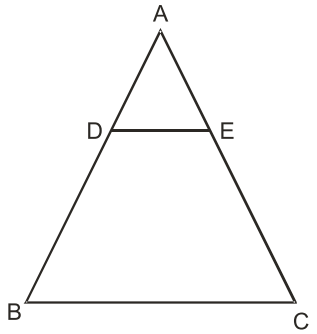
1. All Questions are compulsory.
2. The question paper consists of thirty questions divided into 4 sections A, B, C and D. Section A comprises of ten questions of 01 mark each, section B comprises of five questions of 02 marks each, section C comprises of ten questions of 03 marks each and section D comprises of five questions of 06 marks each.
3. All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.
4. There is no overall choice. However, internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 06 marks each. You have to attempt only one of the alternatives in all such questions.
5. In question on construction, drawings should be neat and exactly as per the given measurements.
6. Use of calculators is not permitted.However you may ask for mathematical tables.

Section A

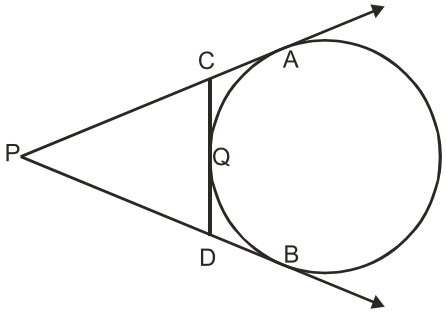
1. Write the condition to be satisfied by q so that a rational number $\frac{p}{q}$ has a terminating decimal expansion.
2. The sum and product of the zeroes of a quadratic polynomial are - ½ and -3 repectively. What is the quadratic polynomial?
3. For what value of k the quadratic equation $x^2 - kx + 4 = 0$ has equal roots?
4. Given that $\tan\theta = \frac{1}{\sqrt{5}}$, what is the value of $\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$
5. Which term of the sequence 114, 109, 104 .... is the first negative term ?

6. A cylinder, a cone and a hemisphere are of equal base and have the same height. What is the ratio in their volumes?

7. In the given figure, DE is parallel to BC and AD = 1cm, BD = 2cm. What is the ratio of the area of Δ ABC to the area of Δ ADE?

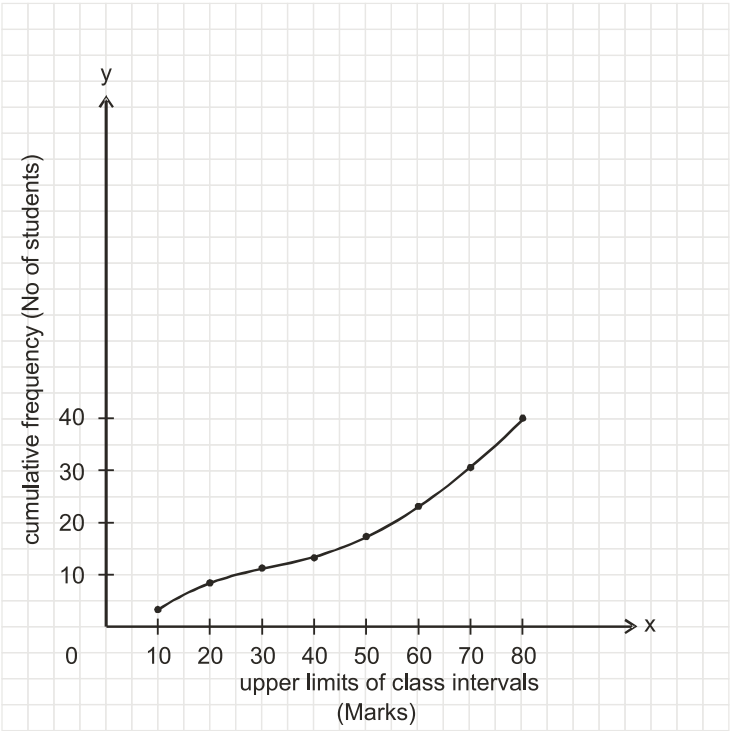


8. In the figure given below, PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PB = 10cm, and CQ = 2cm, what is the length of PC?



9. Cards each marked with one of the numbers 4,5,6....20 are placed in a box and mixed thoroughly. One card is drawn at random from the box. What is the probability of getting an even prime number ?

10. A student draws a cumulative frequency curve for the marks obtained by 40 students of a class, as shown below. Find the median marks obtained by the students of the class.



Section B

11 Without drawing the graphs, state whether the following pair of linear equations will represent intersecting lines, coincident lines or parallel lines :

$6x - 3y + 10 = 0$

$2x - y + 9 = 0$

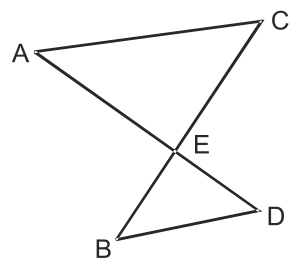
Justify your answer.

12. Without using trigonometric tables, find the value of $\frac{\cos 70^\circ}{\sin 20^\circ} + \cos 57^\circ \operatorname{cosec} 33^\circ - 2\cos 60^\circ$

13 Find a point on the y-axis which is equidistant from the points A(6,5) and B (-4,3).

14 In the figure given below, AC is parallel to BD,

Is $\frac{AE}{CE} = \frac{DE}{BE}$? Justify your answer.



15. A bag contains 5 red, 8 green and 7 white balls. One ball is drawn at random from the bag, find the probability of getting

(i) a white ball or a green ball.

(ii) neither a green ball not a red ball.

OR

One card is drawn from a well shuffled deck of 52 playing cards. Find the probability of getting

(i) a non-face card

(ii) A black king or a red queen.

Section C

16 Using Euclid's division algorithm, find the HCF of 56, 96 and 404.

OR

Prove that $3-\sqrt{5}$ is an irrational number

17. If two zeroes of the polynomial $x^4+3x^3-20x^2-6x+36$ are $\sqrt{2}$ and $-\sqrt{2}$, find the other zeroes of the polynomial.

18. Draw the graph of the following pair of linear equations

$x + 3y = 6$

$2x - 3y = 12$

Hence find the area of the region bounded by the

$x = 0,\ y = 0$ and $2x - 3y = 12$

19. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs 200 for Ist day, Rs. 250 for second day, Rs. 300 for third day and so on. If the contractor pays Rs 27750 as penalty, find the number of days for which the construction work is delayed.

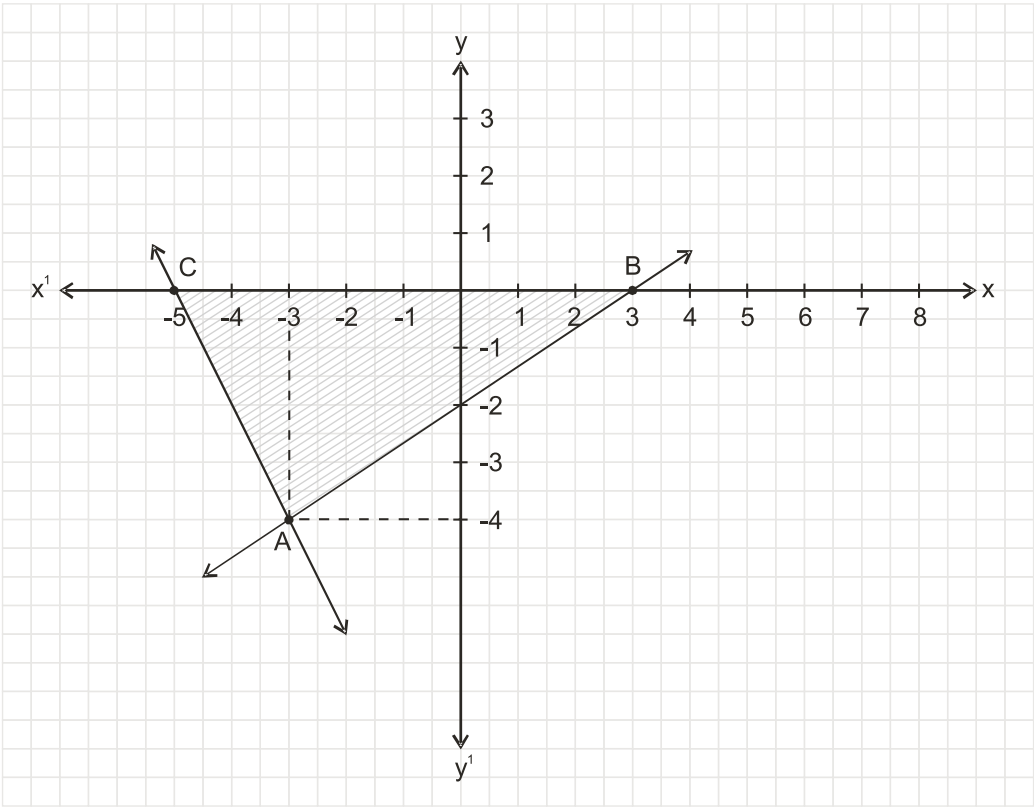
20. Prove that : $\dfrac{1+\cos A}{\sin A} + \dfrac{\sin A}{1+\cos A} = 2\,\text{cosec}\,A$

OR

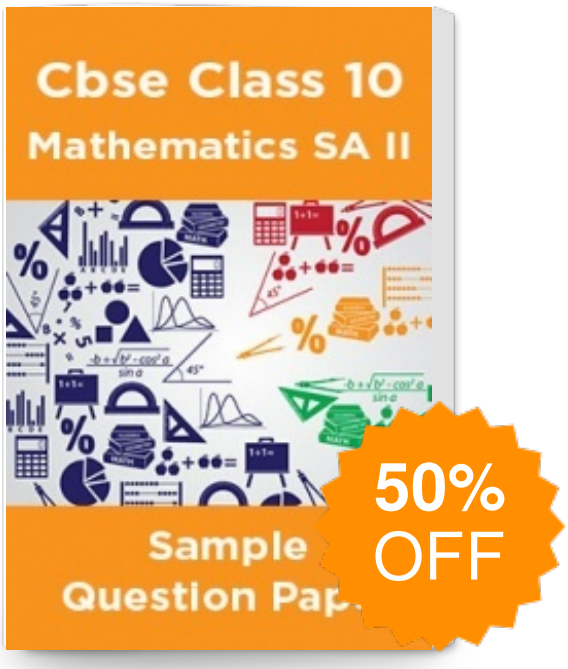
Prove that:

$$\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{\sin^2 A - \cos^2 A}$$

21 Observe the graph given below and state whether triangle ABC is scalene, isosceles or equilateral. Justify your answer. Also find its area.



CBSE Class 10 Mathematics SA II Sample Question Paper



Publisher : Faculty Notes

Author : Panel of Experts