

**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**SECONDARY SCHOOL CERTIFICATE**

**CLASS X**

**MODEL EXAMINATION PAPER 2020**

**Mathematics Paper II**

**Time: 2 hours 10 minutes    Marks: 40**

**INSTRUCTIONS**

**Please read the following instructions carefully.**

1. Check your name and school information. Sign if it is accurate.

**I agree that this is my name and school.  
Candidate's Signature**

**RUBRIC**

2. There are NINE questions. Answer ALL questions. Choices are specified inside the paper.
3. When answering the questions:  
  
Read each question carefully.  
Use a black pointer to write your answers. DO NOT write your answers in pencil.  
Use a black pencil for diagrams. DO NOT use coloured pencils.  
DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.  
Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ( ).
5. You may use a simple calculator if you wish.

Q.1.

(Total 4 Marks)

The given data represent distance covered by 30 cyclists in a race.

Distance (km)	Frequency	Class Width	Frequency Density
$0 \leq x < 4$	7	4	1.75
$4 \leq x < 10$	3	6	0.5
$10 \leq x < 14$	8	4	2
$14 \leq x < 22$	4	8	0.5
$22 \leq x < 32$	8	10	0.25

- i. Draw a histogram for the given data.
- ii. Hence, find the area of bars that represent  $0 \leq x < 8$ .

Space for Diagram

(ATTEMPT EITHER PART a OR PART b OF Q.2.)

Q.2.

(Total 5 Marks)

- a. Simplify  $(a^3x^2 - 2a^2xb + ab^2) \div (a^3x^2 - ab^2)$  to express as  $\frac{ax-b}{ax+b}$ .

---

---

---

---

---

---

---

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

PLEASE TURN OVER THE PAGE

(ATTEMPT EITHER PART a OR PART b OF Q.2.)

- b. Complete the solution of the square root of an algebraic expression by filling the space provided. Hence, verify your answer.

.....	$36x^4 - \dots x^3 + \dots x^2 - 16x + \dots$
.....	.....
$12x^2 - \dots x$	$- 96x^3 + \dots x^2$
$- \dots x$	$\mp 96x^3 \pm \dots x^2$
$12x^2 - 16x + 1$	$\times \quad 12x^2 - \dots x + \dots$
	$\dots x^2 - 16x + \dots$

AKU-EB 2020  
Model Paper for Teaching & Learning

(ATTEMPT EITHER PART a OR PART b OF Q.3.)

Q.3.

(Total 4 Marks)

- a. It is given that  $k - k^2\sqrt{x+1} = k\sqrt{x+1}$ , where  $k > 0$ .

Show, by working, that the above equation reduces to  $x+1 = \left(\frac{1}{k+1}\right)^2$

---

---

---

---

---

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

PLEASE TURN OVER THE PAGE

(ATTEMPT EITHER PART a OR PART b OF Q.3.)

- b. It is given that  $\left|x - \frac{3}{a}\right| + 5 > 5$ ,  $a = \frac{1}{3}$  and  $x$  is an integer.

Find the values of  $x$  which satisfy the given inequality.

---

---

---

---

---

---

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

Q.4.

(Total 3 Marks)

Eight years ago, Mr Farhan was 10 times as old as his neighbour. If the present age of Mr Farhan and his neighbour is  $x$  and  $y$  respectively, then find an

- i. expression of Mr Farhan and his neighbour's age eight years ago.
- ii. equation connecting  $x$  and  $y$  with the help of the given condition.

---

---

---

---

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

PLEASE TURN OVER THE PAGE

Q.5. (Total 4 Marks)

Find the solution set of  $3x^2 - 4x + 2 = 0$ , using quadratic formula.

---

---

---

---

---

---

---

---

---

---

Q.6. (Total 3 Marks)

The midpoint of  $P_1(x, -3)$  and  $P_2(y, 7)$  is  $(a, b)$ . Show that  $a - b = \frac{1}{2}(x + y - 4)$ .

---

---

---

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning



(ATTEMPT ANY TWO PARTS FROM a, b AND c OF Q.7.)

Q.7.

(Total 6 Marks)

- a. A man stands on a flat surface at a distance of 50 metres from a vertical  $x$  metre high electric pole. The angle of elevation of the top of electric pole from the man on flat surface is  $\theta$ .

- i. Use the given condition to show that  $\theta = \tan^{-1}\left(\frac{x}{50}\right)$  (1 Mark)

---

---

---

- ii. Hence, find the height of electric pole when the angle of elevation is  $45^\circ$ . (2 Marks)

---

---

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

PLEASE TURN OVER THE PAGE

(ATTEMPT ANY TWO PARTS FROM a, b AND c OF Q.7.)

b.

- i. Derive  $l = r\theta$ , where  $r$  is the radius of the circle,  $l$  is the length of circular arc and  $\theta$  is the central angle measured in radians. (2 Marks)

---

---

---

---

- ii. Hence, find  $\theta$  when  $l = \frac{1}{2}r$ . (1 Mark)

---

---

AKU-EB  
Model Paper 2020  
for Teaching & Learning

AKU-EB  
Model Paper 2020  
for Teaching & Learning

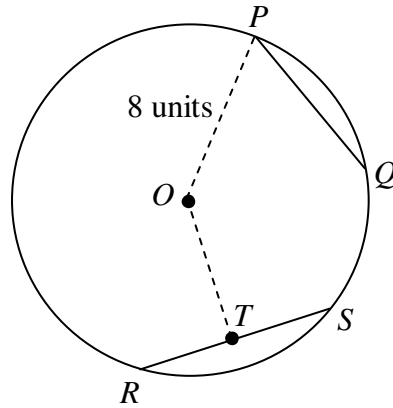
- AKU-EB  
Model Paper 2020  
for Teaching & Learning

AKU-EB  
Model Paper 2020  
for Teaching & Learning

(ATTEMPT ANY TWO PARTS FROM a, b AND c OF Q.8.)

Q.8. (Total 8 Marks)

- a. The given circle having centre  $O$  has a radius of 8 units. Two equal chords  $PQ$  and  $RS$  are of length  $l$  units.



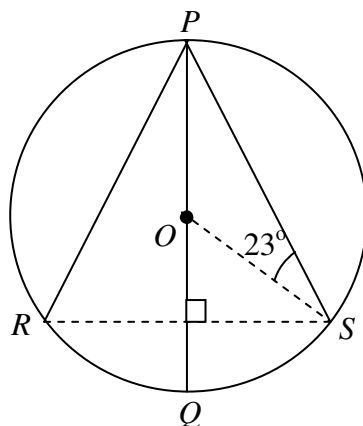
NOT TO SCALE

- i. State, in terms of  $l$ , the length of  $TS$ . (1 Mark)

- ii. Hence, find the value of  $l$  when  $OT = 5$  units. (3 Marks)

(ATTEMPT ANY TWO PARTS FROM a, b AND c OF Q.8.)

- b. In the diagram,  $O$  is the centre of the circle and it is given that  $\angle OSP = 23^\circ$  and  $PS = PR$ .



NOT TO SCALE

- i. State the value of  $\angle OPS$ . (1 Mark)

---



---

- ii. Find the value of  $\angle SOR$ . Show all the necessary working with a valid reason. (3 Marks)

---



---



---



---



---

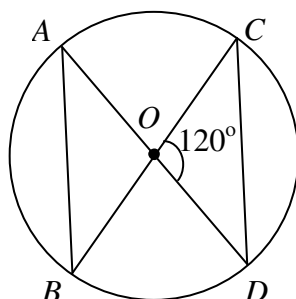


---

PLEASE TURN OVER THE PAGE

(ATTEMPT ANY TWO PARTS FROM a, b AND c OF Q.8.)

- c. The given figure shows a circle having centre  $O$ . If  $AB = CD$ , then find



NOT TO SCALE

- i.  $\angle AOB$

(1 Mark)

- ii.  $\angle AOC$

(1 Mark)

- iii.  $\angle OCD$

(1 Mark)

- iv.  $\angle OBA$

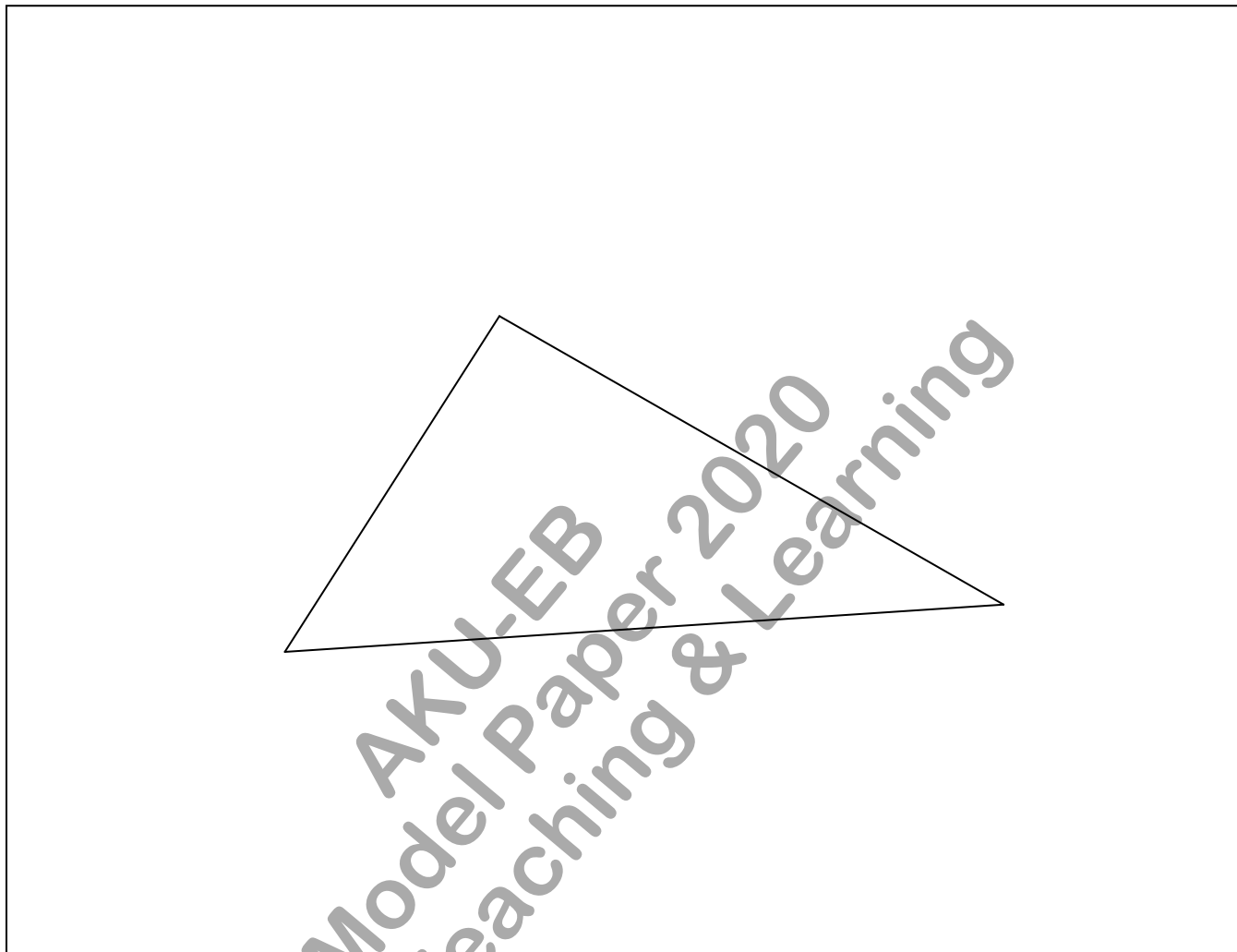
(1 Mark)

AKU-EB  
Model Paper 2020  
for Teaching & Learning

Q.9.

(Total 3 Marks)

Draw the inscribed circle of the given triangle.



END OF PAPER

Please use this page for rough work

AKU-EB  
Model Paper 2020  
for Teaching & Learning