

SECTION 1

Answer ALL the questions in this section.

1. All working must be clearly shown.

(a) Calculate the exact value of

$$\frac{4\frac{3}{5} + 3\frac{4}{5}}{4 - 3\frac{7}{10}} \quad (\text{ans. } 28) \quad (4 \text{ marks})$$

(b) A piece of ribbon 128 cm long is divided into three pieces in the ratio 2:5:9. Calculate the length of the longest piece of ribbon. (ans. 72 cm) (3 marks)

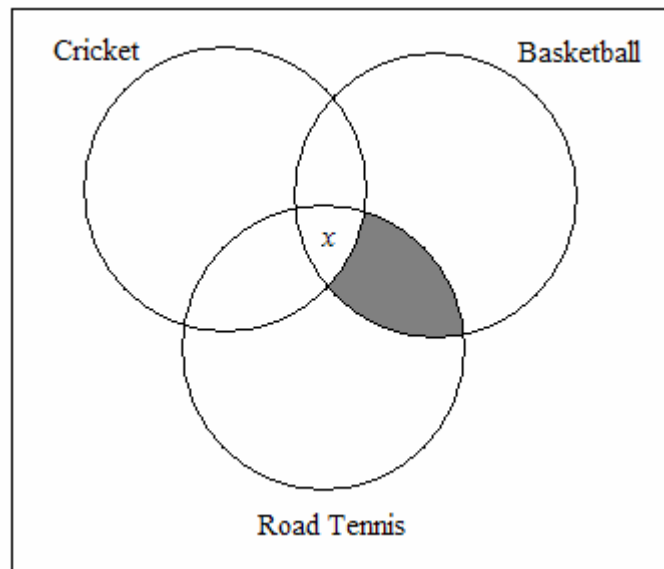
(c) A businessman sold a shirt for \$45.36, making a profit of 8%. Calculate:

(i) the cost price of the shirt. (ans. \$42)

(ii) the selling price of the shirt if the business man is to make a profit of 15%. (ans. \$48.30)
(5 marks)

2. (a) Solve $\frac{x}{6} - 5 = \frac{x}{3} - 1$ (ans. $x = -24$) (4 marks)

(b)



The Venn diagram above illustrates some of the information given below.

There are 50 members in a sports club.

33 members play cricket.

26 members play basketball

23 members play road tennis.

14 members play cricket and basketball.

7 members play basketball and road tennis.

15 members play cricket and road tennis.

Each member plays AT LEAST ONE of the three games. Let the number of members who play all three games be x .

- (i) Write an algebraic expression to represent the number of members in the shaded region.
- (ii) Describe the shaded region.
- (iii) Write an equation to show the total number of members in the club.
- (iv) Hence, determine the number of members who play all three games. (7 marks)

3. (a) Solve the simultaneous equations:

$$3x + 4y = 1$$

$$5x - 19 = 2y$$

(4 marks)

(b) Factorize completely:

- (i) $1 - 9x^2$
- (ii) $3x^2 + 5x - 2$ (3 marks)

The vector \underline{a} translates the point (5, 6) to the point (2, 3)
 The vector \underline{b} translates the point (-4, -1) to the point (-7, -5)

- (i) State \underline{a} and \underline{b} as column vectors
- (ii) Hence, determine the vector $\frac{1}{2}(\underline{a} + \underline{b})$ (5 marks)

Using ruler and compasses only, construct a quadrilateral ABCD such that AB = AD = 6 cm, BC = 4 cm, angle BAD = 90° and angle ABC = 60°.

Measure and state

- (i) the length of DC
- (ii) the magnitude of angle ADC (6 marks)

(b) The images of K(7,4) and L(3,5) under a single transformation Q are K'(4,-7) and L'(5,-3).

- (i) Describe geometrically the transformation Q.
- (ii) Determine the equation of the line K'L'.

(6 marks)

Copy the table below for $f(x) = 2x^2 + 3x - 5$ for the domain $-3 \leq x \leq 2$, and calculate the missing values

x	-3	$-2\frac{1}{2}$	-2	-1	0	1	2
f(x)			-3				9

(b) Using a scale of 2 cm to represent 1 unit on the x-axis and 1 cm represent 1 unit on the f(x)-axis, draw the graph of $f(x) = 2x^2 + 3x - 5$ for $-3 \leq x \leq 2$.

- (c) For your graph, determine:
- (i) the values of x for which $f(x) = 0$
 - (ii) the minimum value of $f(x)$.

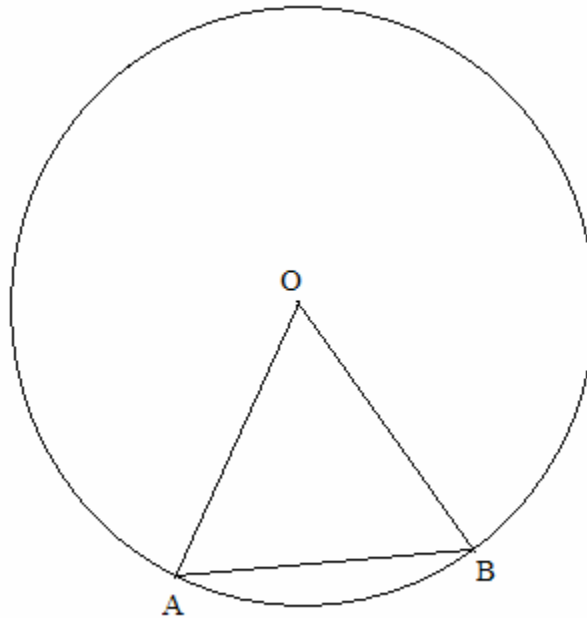
(11 marks)

6. The frequency distribution of the Social Studies marks obtained by 80 candidates is given below.

Marks	Number of Candidates	Cumulative Frequency
0- 10	2	2
11- 20	6	8
21- 30	8	
31-40	11	
41- 50	18	
51- 60	13	
61- 70	9	
71- 80	7	
81- 90	5	
91-100	1	

- (a) Copy the table and complete the cumulative frequency column,
 (b) Using a scale of 1 cm to represent 10 marks on the x-axis and 1 cm to represent 10 candidates on the y-axis, draw the cumulative frequency curve for the data.
 (c) From your cumulative frequency curve, estimate
 (i) the number of candidates who scored at LEAST 50 marks
 (ii) the probability that a candidate chosen at random scored less than 50 marks.
 (11 marks)

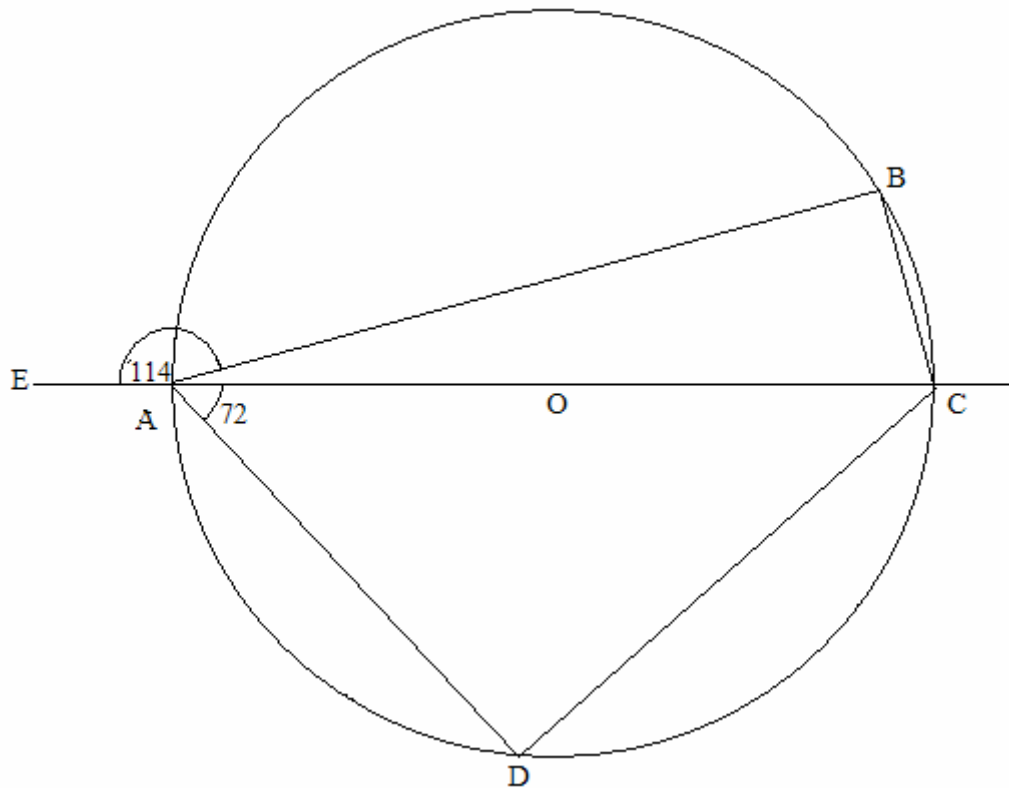
7.



In the figure above, the chord AB subtends angle AOB at O, the centre of the circle. If angle AOB = 100° and $OB = 14$ cm, calculate

- (a) the area of the circle
 (b) the area of the minor sector AOB
 (c) the area of the triangle AOB
 (d) the length of the minor arc AB.

(11 marks)



In the figure above, ABCD is a quadrilateral inscribed in a circle with centre O. The diameter CA has been produced to E. Angle $EAB = 114^\circ$ and angle $OAD = 72^\circ$.

- (a) calculate, giving reasons, the magnitude of angles
- (i) $\angle ABC$
 - (ii) $\angle BAC$
 - (iii) $\angle BCD$
- (b) Given that $OC = 10$ cm calculate the length of CD. (10 marks)