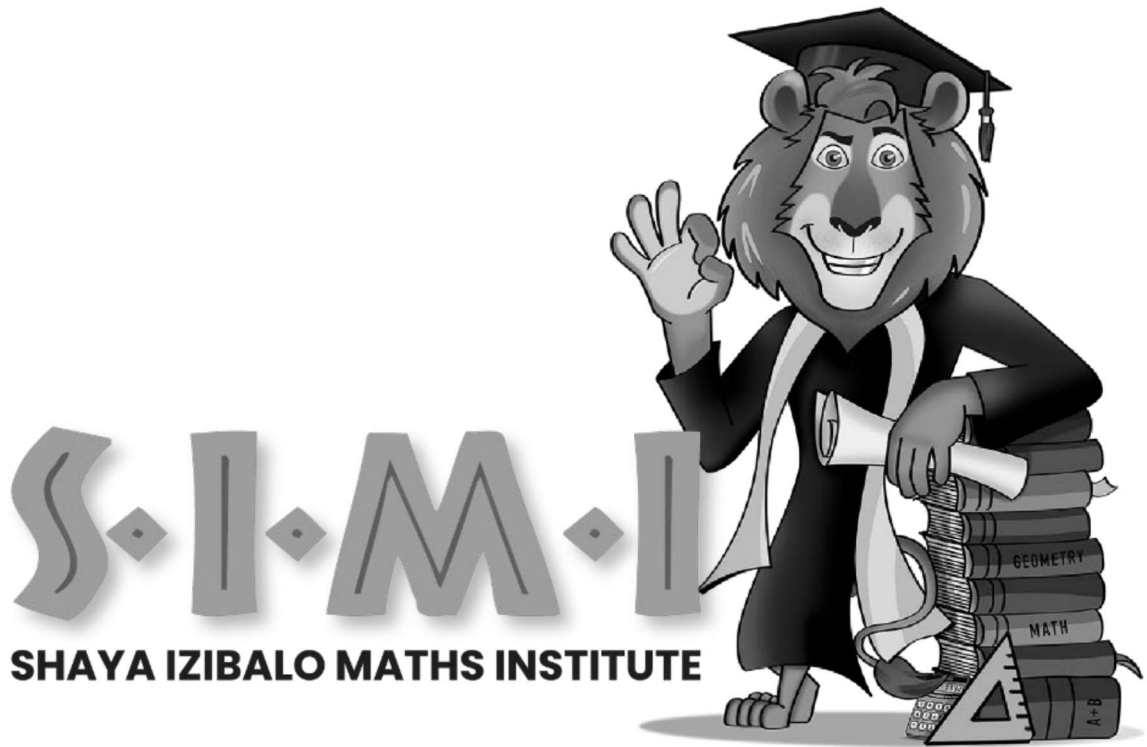


Grade 12 Mathematics

Paper 2 Revision Workshop

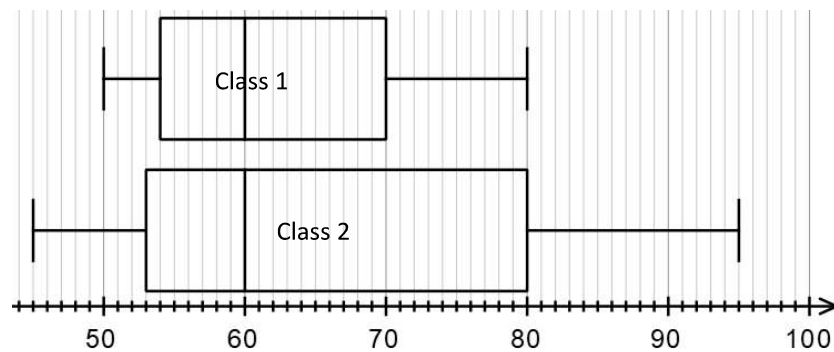
17th October 2026



NAME: _____

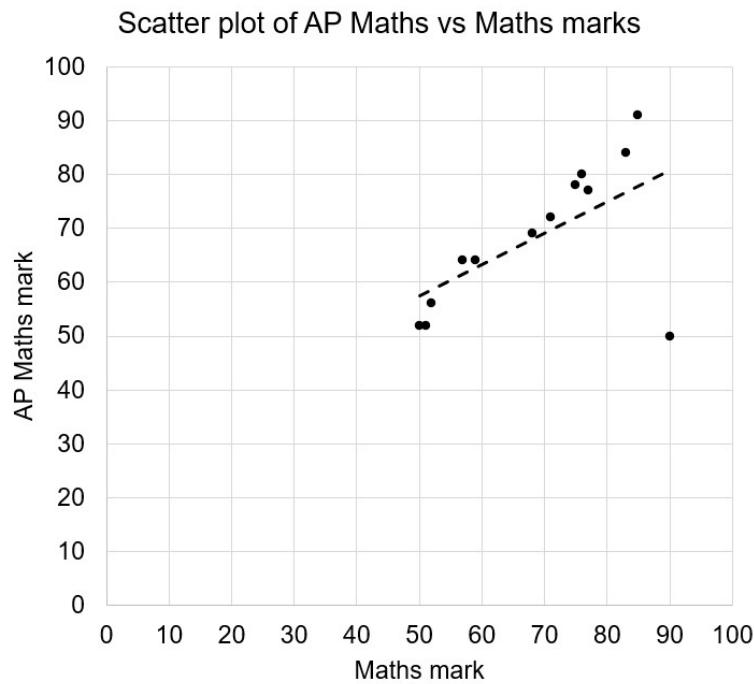
QUESTION 1

- (a) The marks on a Maths test for two different classes are displayed in the box and whisker plots below:



- (i) Determine the median mark for class 1. (1)
- (ii) Determine the inter-quartile range for class 2. (2)
- (iii) Describe the skewness / symmetry of the data in both classes, justifying your answer. (2)
- (iv) Give p if 75% of the candidates in class 1 achieved a mark of greater than p . (1)
- (v) Which class has the greater standard deviation? Justify your answer. (2)

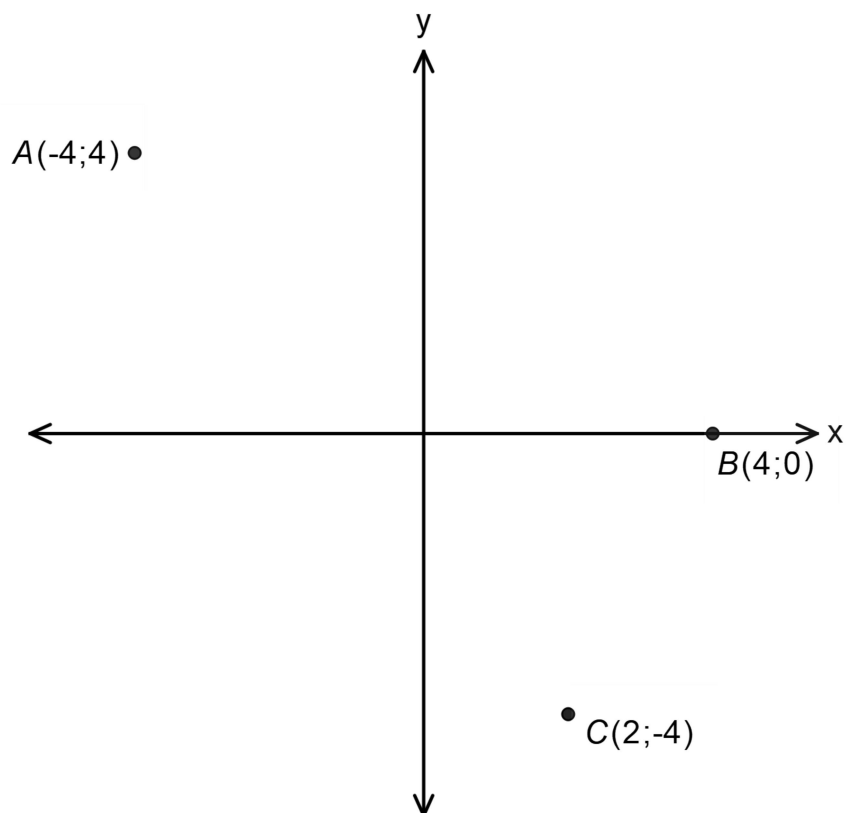
- (b) The Maths and AP Maths marks of 13 students are plotted below:



- (i) Comment on the nature and strength of the relationship between the performance in the two subjects. (2)
- (ii) The teacher plans to use the equation of the least squares regression line (drawn with a dashed line) to predict the AP Maths score of a student who scored 30% for Maths. Comment on the possible reliability of this. (2)
- (iii) One of the students could be considered an outlier. Circle this data point. (1)
- (iv) Suppose the outlier is removed from the data set. How would this affect:
- (1) the correlation coefficient? (1)
- (2) the gradient of the least squares regression line? (1)

QUESTION 2

(a) Consider the points as plotted below:



(i) Show that $\hat{A}BC = 90^\circ$ (3)

(ii) Hence, or otherwise, determine the area of $\triangle ABC$ (4)

(iii) Find the mid-point of line BC (2)

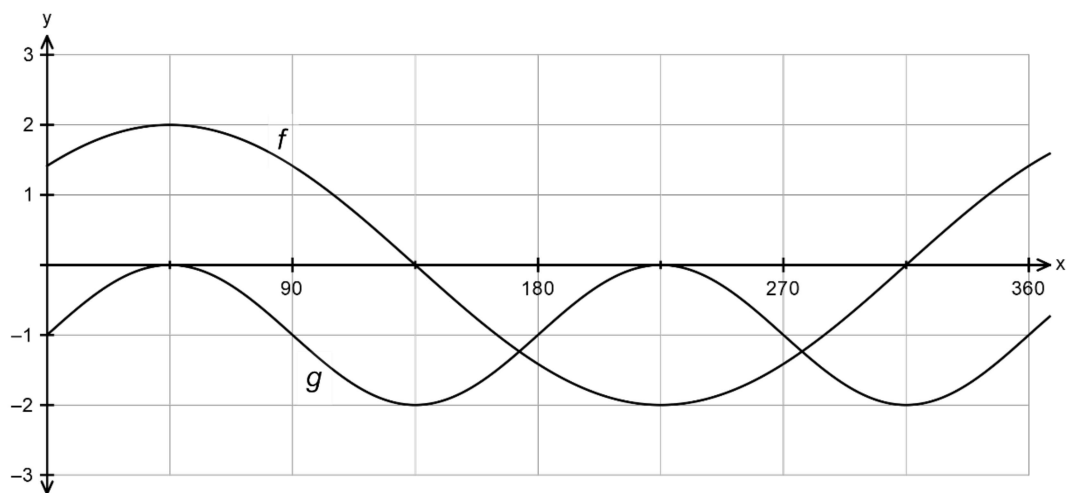
(iv) Find point D if ABCD (in that order) is a rectangle. (2)

(v) Find the equation of AB. (3)

(b) Give the equation of a circle with centre $(5;0)$ and with the y -axis as a tangent. (3)

QUESTION 3

- (a) Give the equations of the functions f and g drawn below: (4)



- (b) Suppose that $\cos 18^\circ = g$. Determine the following in terms of g :

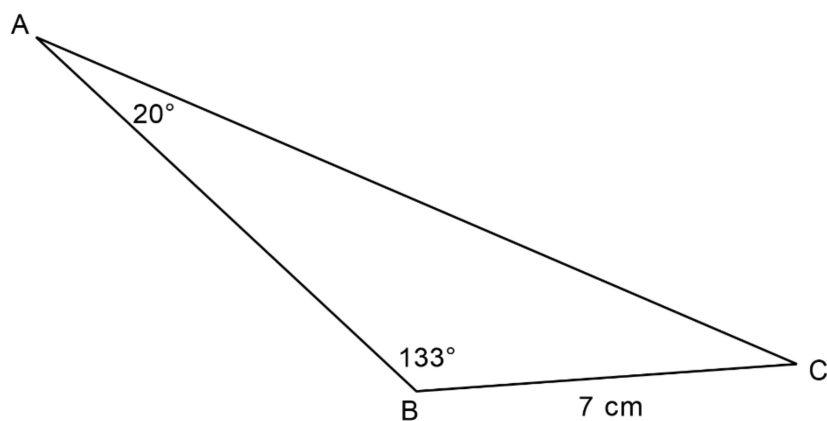
(i) $\cos 342^\circ$ (1)

(ii) $\sin(-108^\circ)$ (2)

(iii) $\cos 144^\circ$ (3)

(iv) $\tan 198^\circ$ (3)

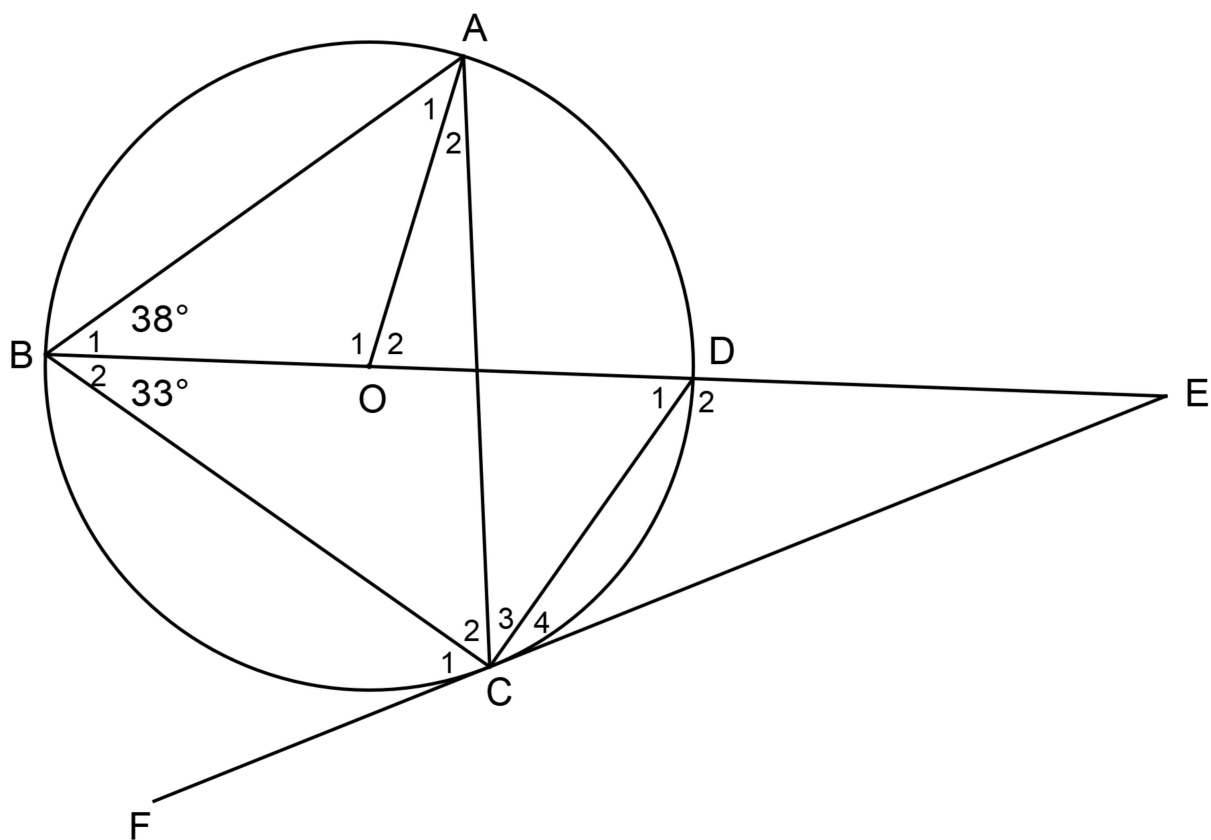
- (c) Determine the area of $\triangle ABC$ to one decimal place. (5)



- (d) Solve $\sin(2\theta + 10^\circ) = -\frac{1}{2}$ for $\theta \in [-180^\circ; 180^\circ]$ (6)

QUESTION 4

- (a) In the diagram below BOD is a diameter of the circle, centre O. BD is extended to E and FCE is a tangent to the circle at C. $\hat{B}_1 = 38^\circ$ and $\hat{B}_2 = 33^\circ$.



Determine, with reasons, the magnitude of:

- (i) $\hat{BCD}$ (2)

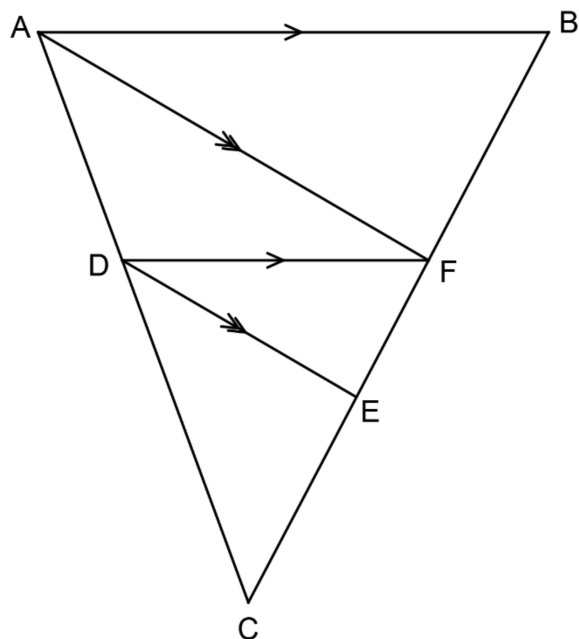
(ii) $\hat{A}_1$ (2)

(iii) $\hat{O}_2$ (2)

(iv) $\hat{C}_4$ (2)



- (b) In the diagram below $AB \parallel DF$ and $AF \parallel DE$. $CF : FB = 3 : 2$



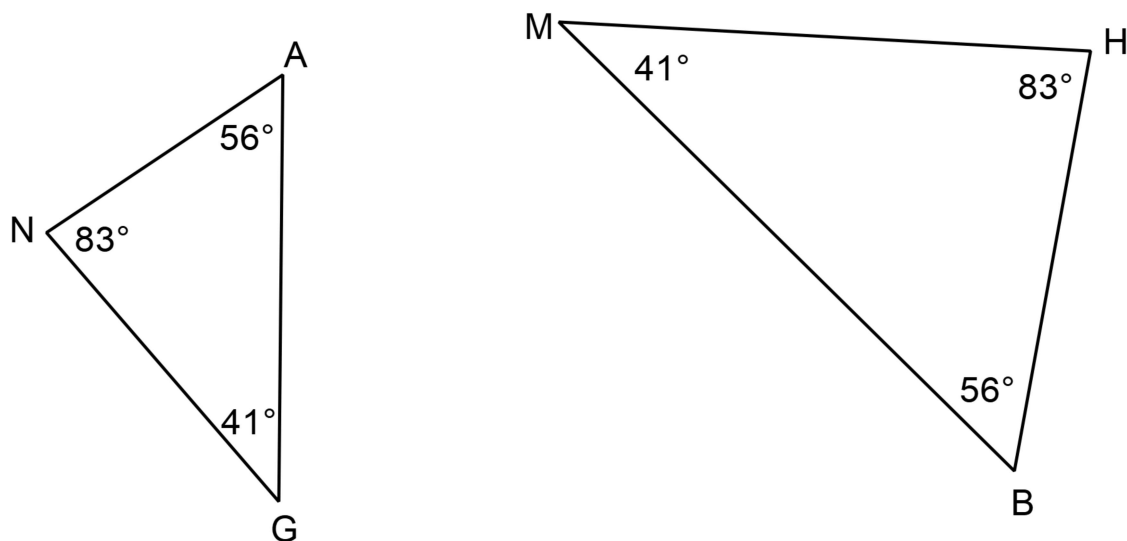
Determine, with reasons:

(i) $AD : DC$ (2)

(ii) $\text{area } \triangle AFD : \text{area } \triangle DFC$ (2)

(iii) $EF : FB$ (4)

- (c) In the diagram below the bigger triangle is 2,25 times bigger in area than the Smaller one. Determine $\frac{AN}{BH}$ giving reasons. (3)



QUESTION 5

(a) Consider the numbers $2p$; $2p$; $6p$; $10p$

(i) Determine the standard deviation in terms of p (4)

(ii) Hence or otherwise determine the standard deviation in terms of p of the following set of numbers:

$3p$; $3p$; $7p$; $11p$ (2)



QUESTION 6

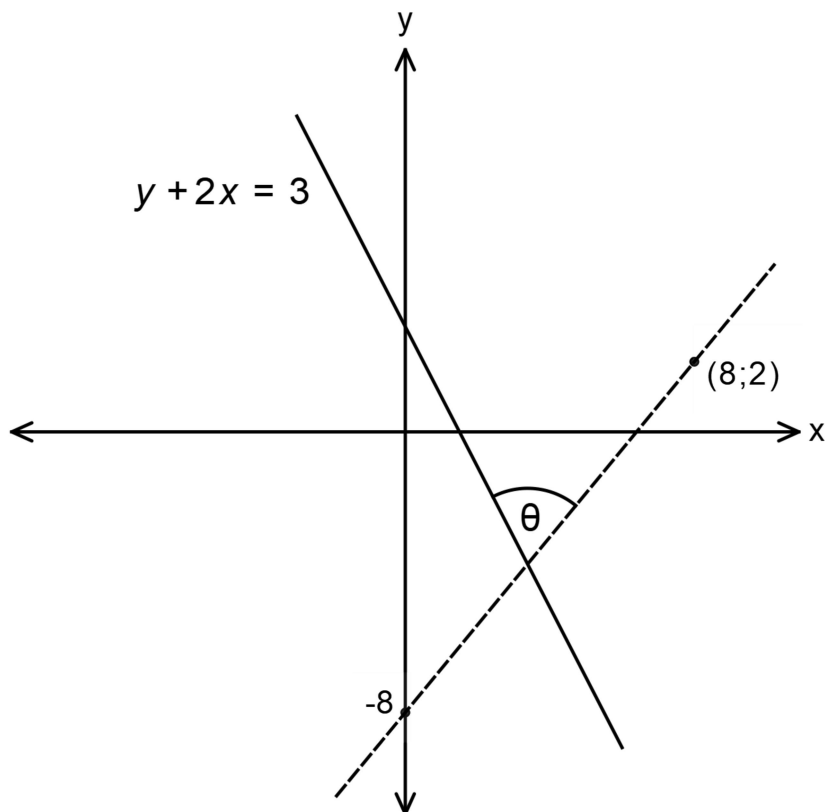
(a) Consider the circle $x^2 + y^2 + 6x - 10y = 31$

(i) Determine the equation of the tangent at the point $A(4;1)$ (6)

(ii) Suppose a tangent (not the one you found above) is drawn from $B(12;-4)$ to a point of contact with the circle, D. Determine the length of BD. (4)



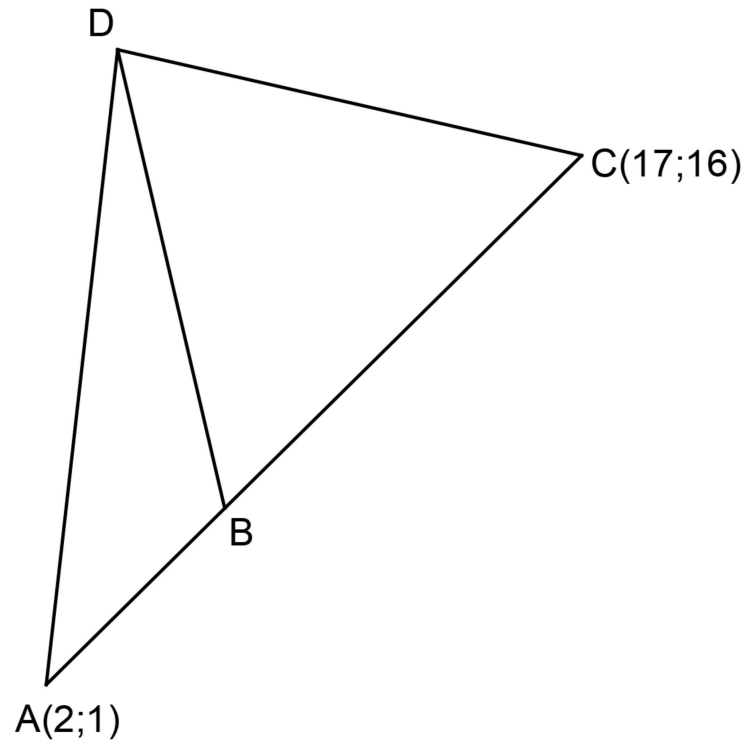
(b) Consider the diagram below.



(i) Determine the gradient of the dashed line. (2)

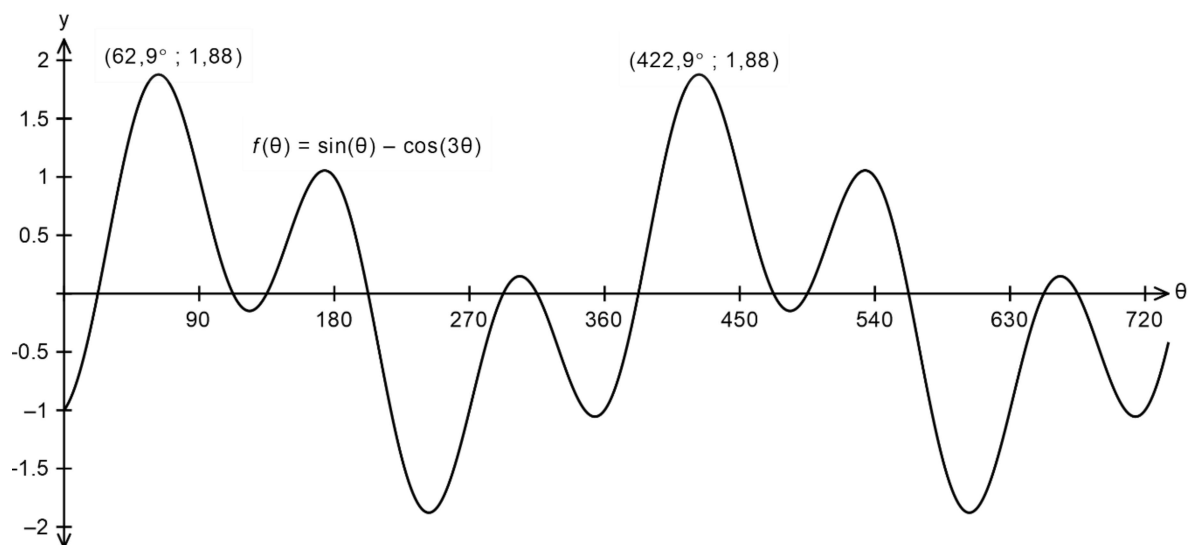
(ii) Hence, or otherwise, determine the size of θ (5)

- (c) Determine the coordinates of point B if $\frac{\Delta ABD}{\Delta DBC} = \frac{1}{2}$. Give reasons for your answer. (5)



QUESTION 7

(a) The function $f(\theta) = \sin(\theta) - \cos(3\theta)$ is drawn below for $\theta \in [0^\circ; 720^\circ]$



(i) Give the period of f (2)

(ii) Determine a general solution for the x-intercepts of f . (6)

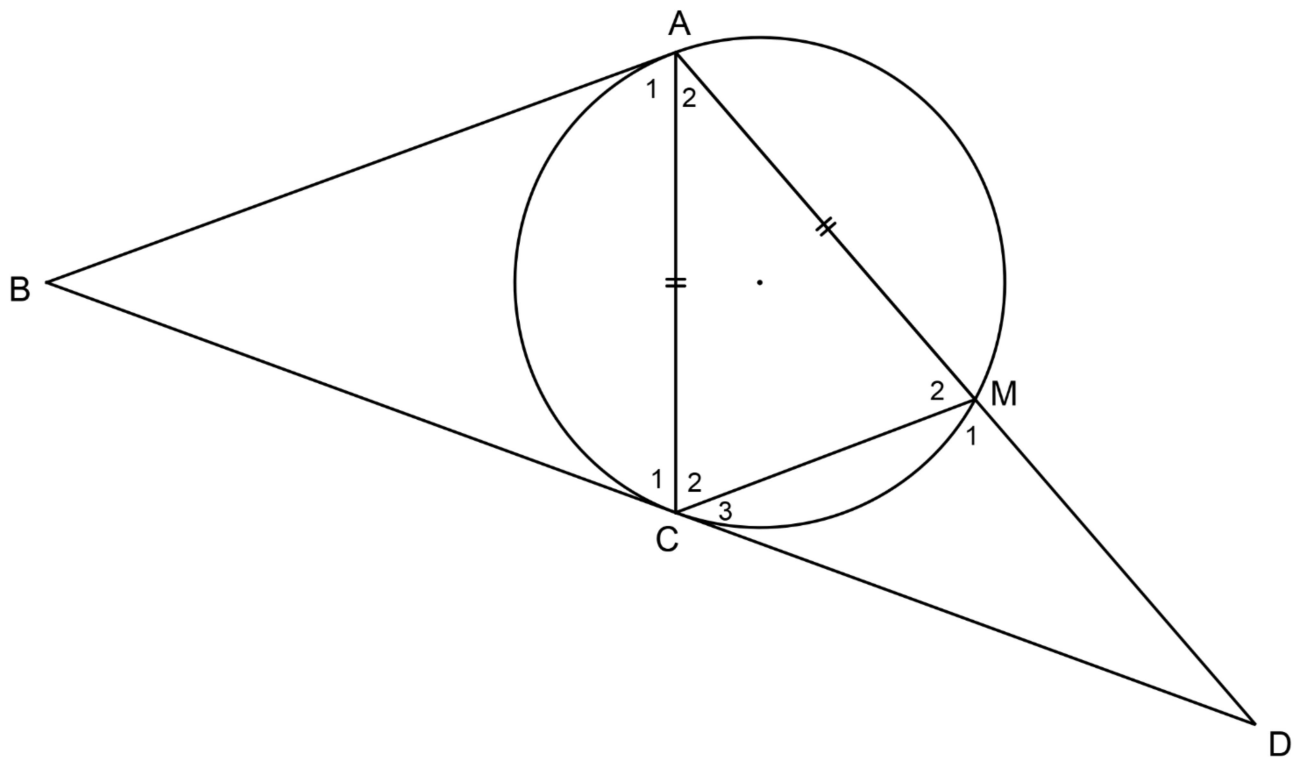
(b) Consider the identity: $\frac{\sin\theta}{\cos\theta - \sin\theta} + \frac{\sin\theta}{\cos\theta + \sin\theta} = \tan 2\theta$

(i) Prove it! (5)

(ii) Hence, or otherwise solve $\frac{\sin\theta}{\cos\theta - \sin\theta} + \frac{\sin\theta}{\cos\theta + \sin\theta} = -1$
for $\theta \in [-180^\circ; 180^\circ]$ (4)

QUESTION 8

- (a) AB and BC are tangents. $AC = AM$.

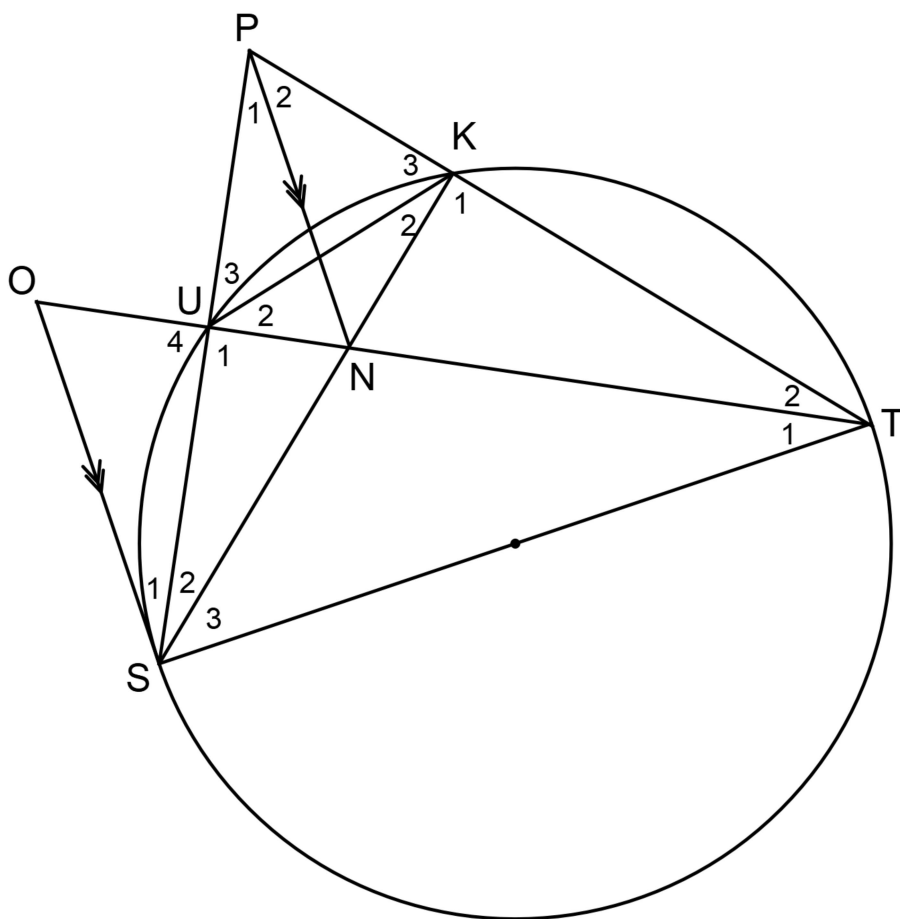


- (i) Prove that $CD^2 = DM \cdot AD$ (5)

(ii) Prove that $\frac{DM}{MA} = \frac{DC}{CB}$ (4)



(b) In the diagram below, ST is the diameter of the circle. $OS \parallel PN$.



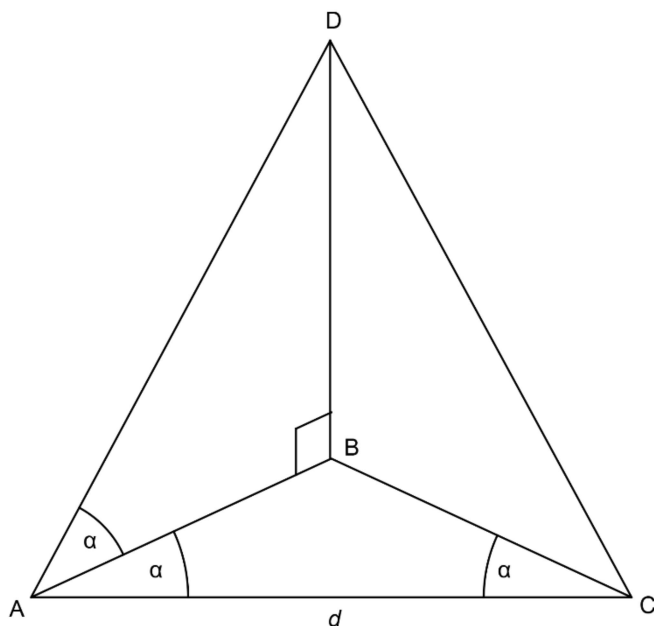
(i) Prove that PUNK is a cyclic quadrilateral. (5)

(ii) Prove that SO is a tangent to the given circle (KUST) (4)



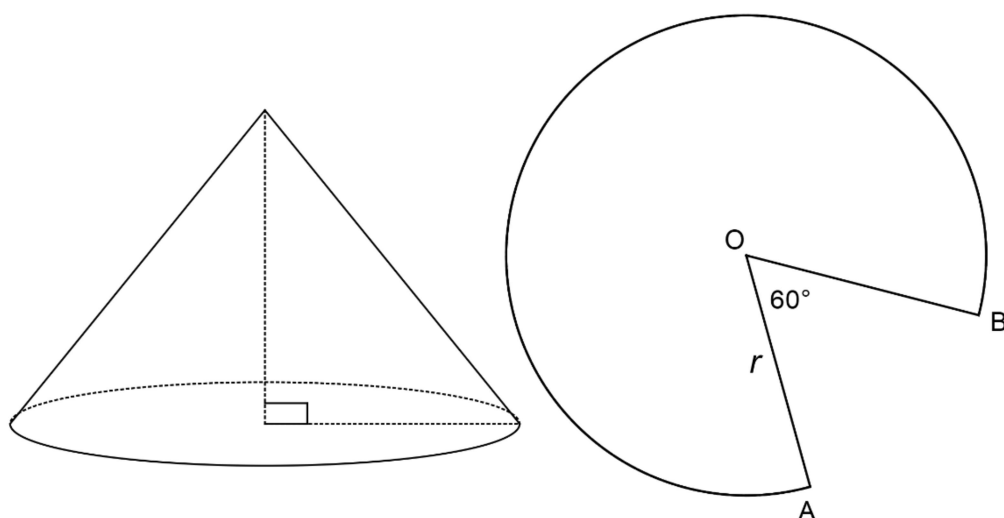
QUESTION 9

- (a) A vertical tower DB has its foot B in the same horizontal plane as points A and C. A and C are d metres apart. $\hat{BAC} = \hat{BCA} = \alpha$ and the angle of elevation of D from A is α .



Prove that the height of the tower is given by $DB = \frac{d \sin \alpha}{2 \cos^2 \alpha}$ (6)

- (b) A right circular cone as shown is made by cutting a sector out of a circle of radius, r and then taping edge OA and OB together. Determine the size of the angle which the sides make with the base. (6)



FORMULA SHEET

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\sum_{i=1}^n 1 = n$$

$$T_n = a + (n - 1)d$$

$$T_n = ar^{n-1} \quad S_n = \frac{a(r^n - 1)}{r - 1}; r \neq 1$$

$$\sum_{i=1}^n i = \frac{n(n+1)}{2}$$

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

$$S_\infty = \frac{a}{1 - r}; -1 < r < 1$$

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$A = P(1 + ni)$$

$$A = P(1 + i)^n$$

$$F = P \left[\frac{(1 + i)^n - 1}{i} \right]$$

$$A = P(1 - ni)$$

$$A = P(1 - i)^n$$

$$P = P \left[\frac{1 - (1 + i)^{-n}}{i} \right]$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$y = mx + c$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$(x - a)^2 + (y - b)^2 = r^2$$

$$M \left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2} \right)$$

$$y - y_1 = m(x - x_1)$$

$$m = \tan \theta$$



$$\text{In } \Delta ABC: \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

$$\text{area } \Delta ABC = \frac{1}{2} ab \cdot \sin C$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$$

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$\cos 2\alpha = \begin{cases} \cos^2 \alpha - \sin^2 \alpha \\ 1 - 2\sin^2 \alpha \\ 2\cos^2 \alpha - 1 \end{cases}$$

$$\sin 2\alpha = 2\sin \alpha \cos \alpha$$

$$\bar{x} = \frac{\sum fx}{n}$$

$$\sigma^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$\hat{y} = a + bx$$

$$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$





