Confidential

basic education

Department:
Basic Education
**REPUBLIC OF SOUTH AFRICA**

**SENIOR CERTIFICATE EXAMINATIONS/**
**NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

**MATHEMATICS P2**

**MAY/JUNE 2026**



**MARKS: 150**

**TIME: 3 hours**

**This question paper consists of 13 pages, 1 information sheet and an answer book of 23 pages.**





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## INSTRUCTIONS AND INFORMATION

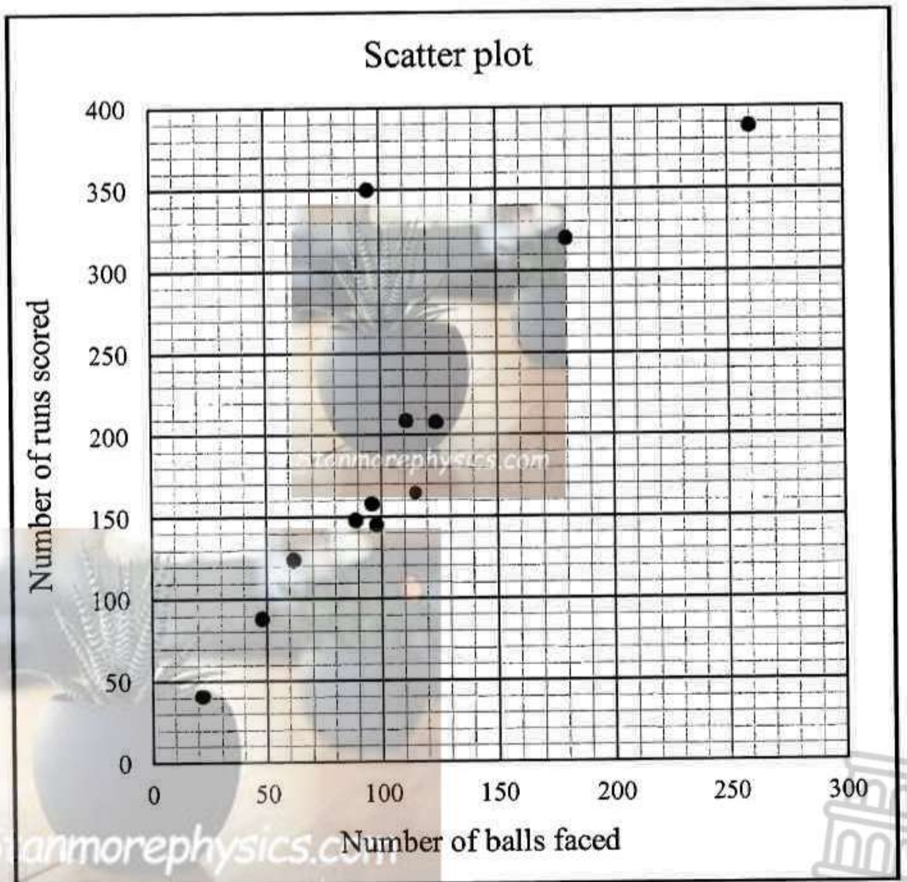
Read the following instructions and information carefully before answering the questions.

1. This question paper consists of 11 questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. An information sheet with formulae is included at the end of the question paper.
9. Write neatly and legibly.

**QUESTION 1**

There are 12 players in a cricket team. In a tournament, the number of balls each player faced and the corresponding number of runs each player scored are given in the table and the scatter plot below.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NUMBER OF BALLS FACED ($x$)** | 62 | 111 | 22 | 48 | 124 | 180 | 89 | 96 | 95 | 260 | 98 | 115 |
| **NUMBER OF RUNS SCORED ($y$)** | 124 | 209 | 41 | 88 | 208 | 320 | 148 | 158 | 350 | 388 | 145 | 165 |




1.1 Calculate the equation of the least squares regression line. (3)

1.2 Estimate the number of runs a cricket player, who faced a total of 150 balls, made. (2)

1.3 Calculate how many players scored runs that were more than one standard deviation above the mean. (4)

1.4 Explain why (95 ; 350), the outlier, does NOT fit the trend of this set of data. (1)
**[10]**

**QUESTION 2**

2.1 The marks, as a percentage, that Grade 12 learners at a certain school obtained in the Mathematics examination in June 2025 was summarised in the frequency table below.

| CLASS INTERVALS (AS A %) | FREQUENCY |
|---|---|
| $20 < x \leq 30$ | 8 |
| $30 < x \leq 40$ | 14 |
| $40 < x \leq 50$ | 16 |
| $50 < x \leq 60$ | 21 |
| $60 < x \leq 70$ | 16 |
| $70 < x \leq 80$ | 9 |
| $80 < x \leq 90$ | 6 |
| $90 < x \leq 100$ | 2 |

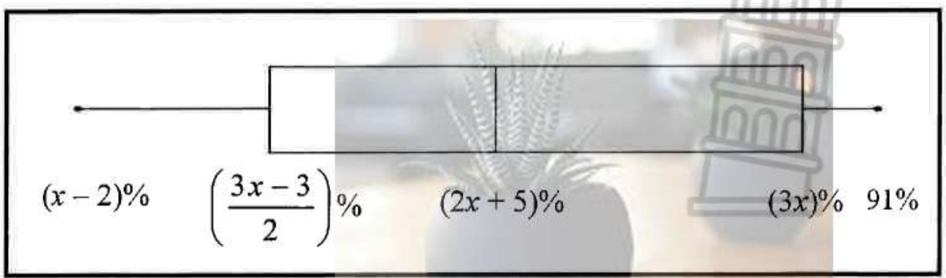
2.1.1 Write down the modal class interval for the data. (1)

2.1.2 Complete the cumulative frequency column in the table provided in the ANSWER BOOK. (2)

2.1.3 Draw a cumulative frequency curve (ogive) to represent the data above. (3)

2.1.4 Use the cumulative frequency curve (ogive) to estimate the median of the data. (1)

2.2 The marks, as a percentage, that Grade 12 learners at another school obtained in the same examination, are represented in the box and whisker diagram below.



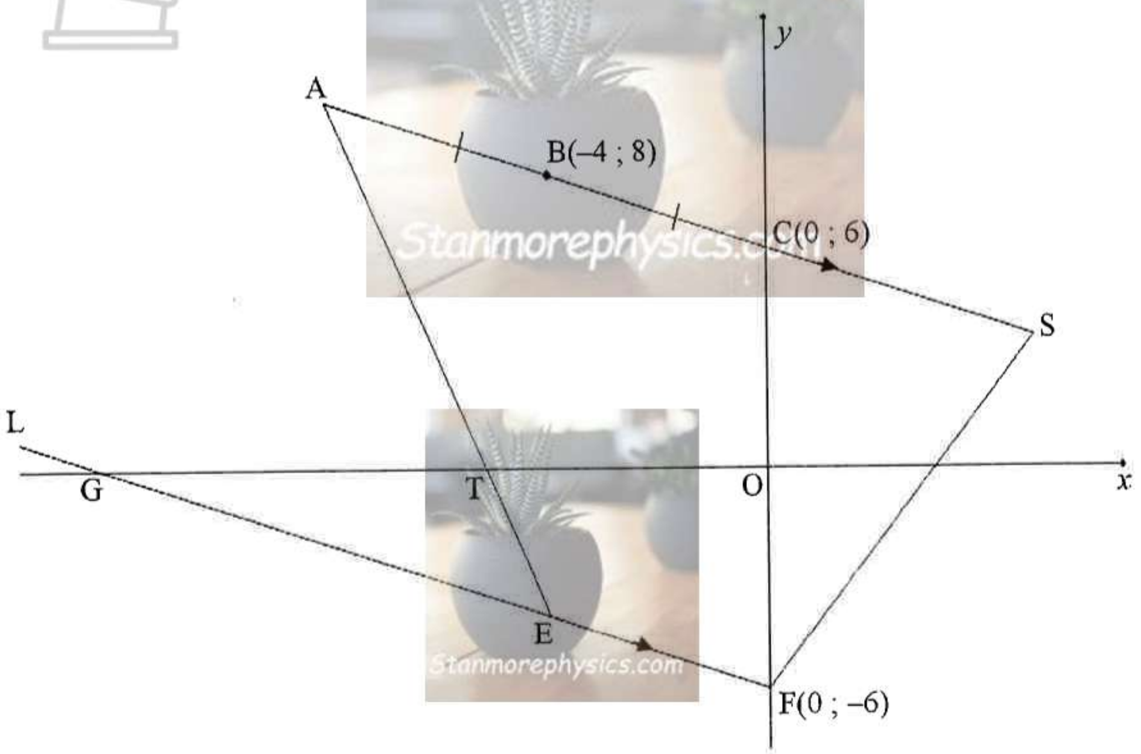

If it is given that the interquartile range (IQR) of the data is 45%, calculate the minimum percentage of learners who passed in this centre. (3)

**[10]**

**QUESTION 3**

In the diagram, AS intersects the $y$-axis at C(0 ; 6). B(–4 ; 8) is the midpoint of AC. The coordinates of F are (0 ; –6). LF is drawn parallel to AS and intersects the $x$-axis at G. E is a point on LF such that the equation of AE is $y=-\frac{7}{2}x-18$.

AE intersects the $x$-axis at T. SF is drawn.




3.1 Calculate the coordinates of A. (3)

3.2 Determine the equation of line LF. (3)

3.3 Calculate the coordinates of E. (3)

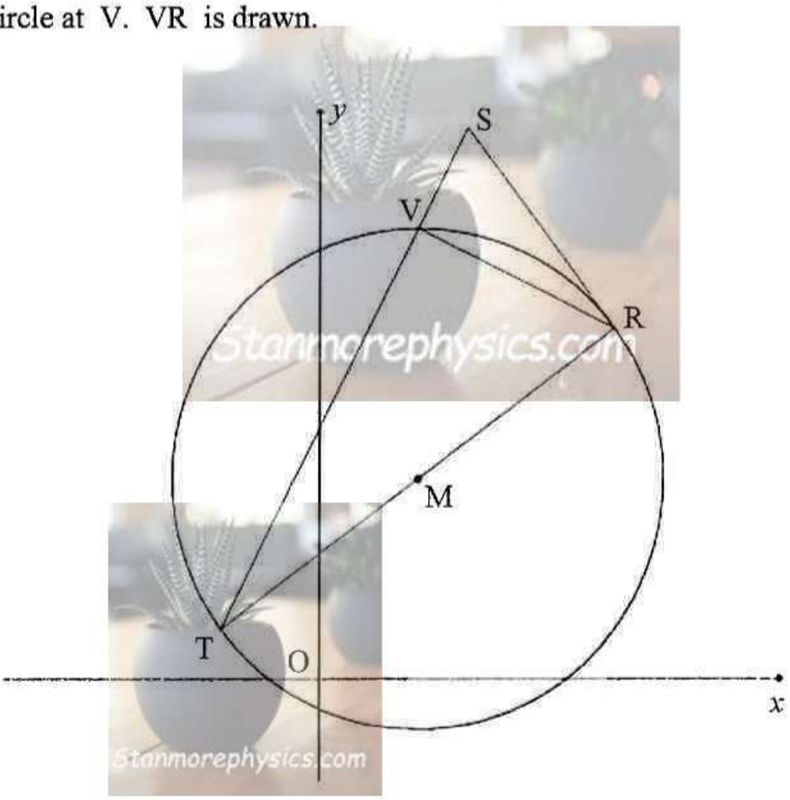
3.4 Determine the equation of the circle passing through C, S and F if it is further given that the coordinates of S are $\left(\frac{24}{5};\frac{18}{5}\right)$. (5)

3.5 Calculate the size of $A\hat{E}G$. (4)

**[18]**

**QUESTION 4**

In the diagram, the equation of the circle having a centre at M is $(x-2)^2+(y-4)^2=25$. Diameter TMR and tangent SR are drawn. The equation of line ST is $y=2x+5$. ST intersects the circle at V. VR is drawn.




4.1 Write down the coordinates of M, the centre of the circle. (2)

4.2 Show that the coordinates of T are T(–2 ; 1). (4)

4.3 Write down the coordinates of V. (2)

4.4 Calculate the gradient of TR. (2)

4.5 Determine the equation of SR, the tangent to the circle at R. (5)

4.6 Another circle passes through points A(–3 ; –1), B($x$ ; $y$) and C(2 ; 3) such that AC is a diameter of the circle. The circle passing through A, B and C intersects the given circle with equation $x^2-4x+y^2-8y-5=0$. Determine the equation of the line that passes through the points of intersections of both circles. (6)

4.7 If a constant $k$ is added to the equation of the circle such that $(x-2)^2+(y-4)^2+k=25$, what effect will $k$ have on the circle if $0<k<25$? (1)

**[22]**

**QUESTION 5**

5.1 Given: $\sin(A-B) = \sin A.\cos B - \cos A.\sin B$

5.1.1 Use the formula given above to derive a formula for $\sin(A+B)$ (2)

5.1.2 Hence, **without using a calculator**, solve for $x$ in the interval $x \in [0°\,;\,360°]$ if
$\sqrt{3}\cos x = \sin(50°+x).\cos(10°-x) + \cos(50°+x).\sin(10°-x)$ (4)

5.2 Prove the identity: $\dfrac{\sin 2x}{2\cos^2 x} + \dfrac{\sin x}{\tan x\left[1+\cos(90°-x)\right]} = \dfrac{1}{\cos x}$ (5)

5.3 Show, **without using a calculator**, that $\sin 260° = -\sqrt{\dfrac{\cos 20°+1}{2}}$ (4)
**[15]**



**QUESTION 6**

6.1 Given: $\cos 330°.\cos 365° + \sin 175°.\sin 210°$

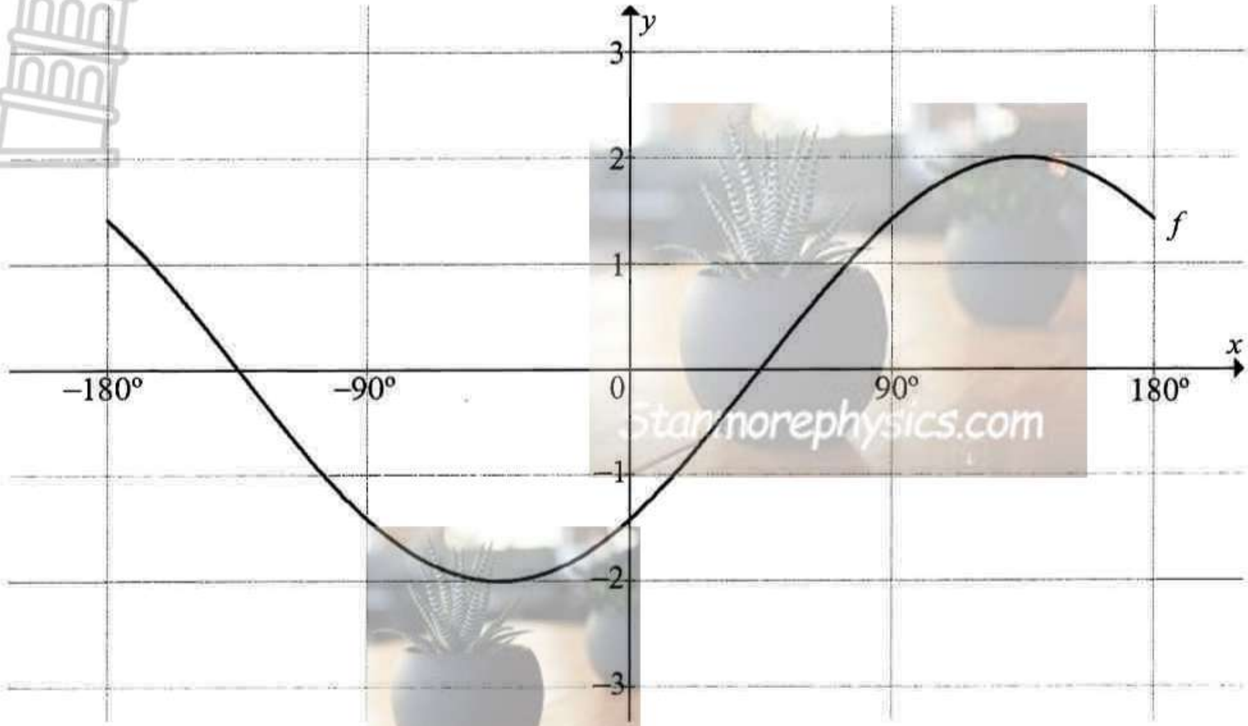
6.1.1 **Without using a calculator**, simplify the above expression to a single trigonometric ratio. (5)

6.1.2 Hence, determine $\sin 70°$ in terms of $p$ if
$\cos 330°.\cos 365° + \sin 175°.\sin 210° = p$ (3)

6.2 It is given that $\dfrac{2^{3\sin^2 x}}{4.2^{\sin x}} = 1$. Determine the general solution for $x$ if $\sin x < 0$. (6)
**[14]**

**QUESTION 7**

In the diagram, $f(x) = 2\sin(x - 45°)$ is drawn for the interval $x \in [-180° ; 180°]$.




7.1 Write down the amplitude of $f$. (1)

7.2 Determine the values of $x$, in the interval $x \in [-180° ; 180°]$, for which $f'(x) \geq 0$. (2)

7.3 On the same set of axes provided in the ANSWER BOOK, draw the graph of $g(x) = -\tan x$ for the interval $x \in [-180° ; 180°]$. (3)

7.4 Write down the value of $g(-45°) - f(-45°)$. (1)

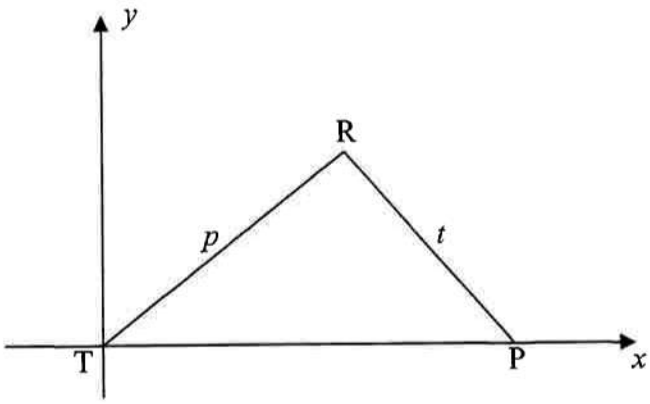
7.5 How many solutions does the equation $g(x) - f(x) = 0$ have in the interval $x \in [-180° ; 180°]$? (1)

7.6 Graph $h$ is obtained when $g$ is translated 45° to the right. Write down the equations of the asymptotes of $h$ in the interval $x \in [-180° ; 180°]$. (2)

**[10]**

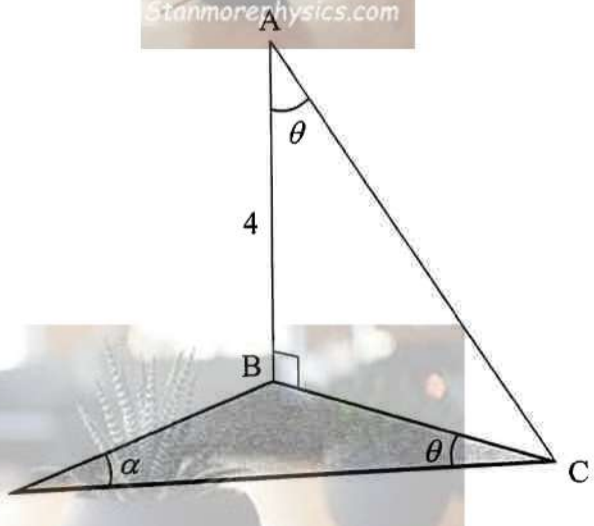
**QUESTION 8**

8.1 In the diagram, $\Delta RTP$ is given with $RT = p$ and $RP = t$.




Prove that $\dfrac{\sin \hat{T}}{t} = \dfrac{\sin \hat{P}}{p}$ (4)

8.2 In the diagram, D, B and C are points in the same horizontal plane. AB is a vertical flagpole. A rope is tied from A, the top of the flagpole, to point C.
$B\hat{A}C = B\hat{C}D = \theta$, $B\hat{D}C = \alpha$ and $AB = 4$ units.




8.2.1 Show that the distance between B and C is $4\tan\theta$ (1)

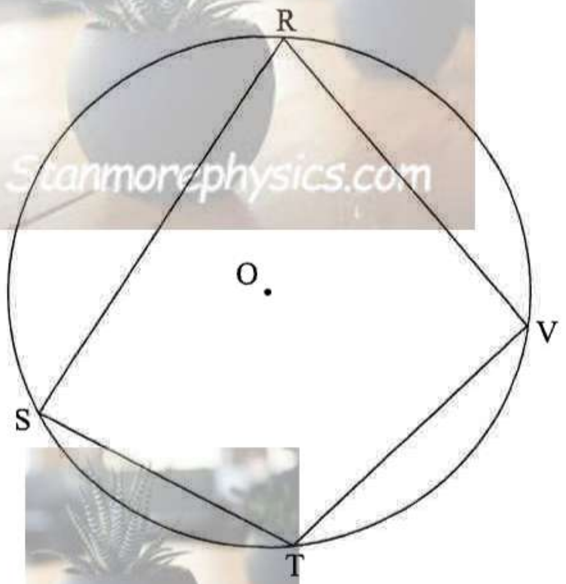
8.2.2 Hence, show that $DC = 4\sin\theta\left(1 + \dfrac{\tan\theta}{\tan\alpha}\right)$ (5)

**[10]**

**Give reasons for your statements in QUESTIONS 9, 10 and 11.**

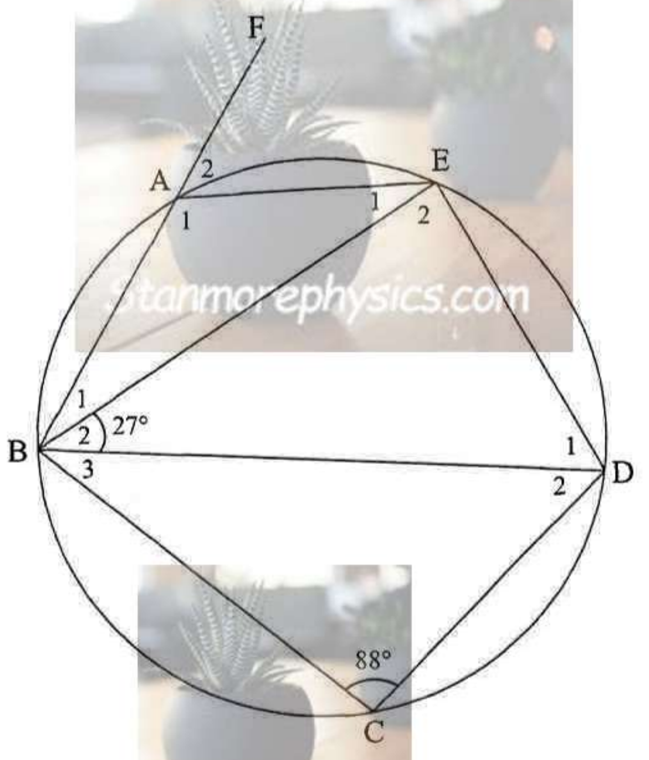
**QUESTION 9**

9.1 In the diagram, O is the centre of the circle. RSTV is a cyclic quadrilateral.




Use the diagram to prove the theorem which states that the opposite angles of a cyclic quadrilateral are supplementary, i.e. $\hat{R} + \hat{T} = 180°$ (5)

9.2 In the diagram, A, B, C, D and E lie on the circle. BA is produced to F. $\hat{B}_2 = 27°$ and $\hat{C} = 88°$. AE, ED, DC, BC, BE and BD are drawn.



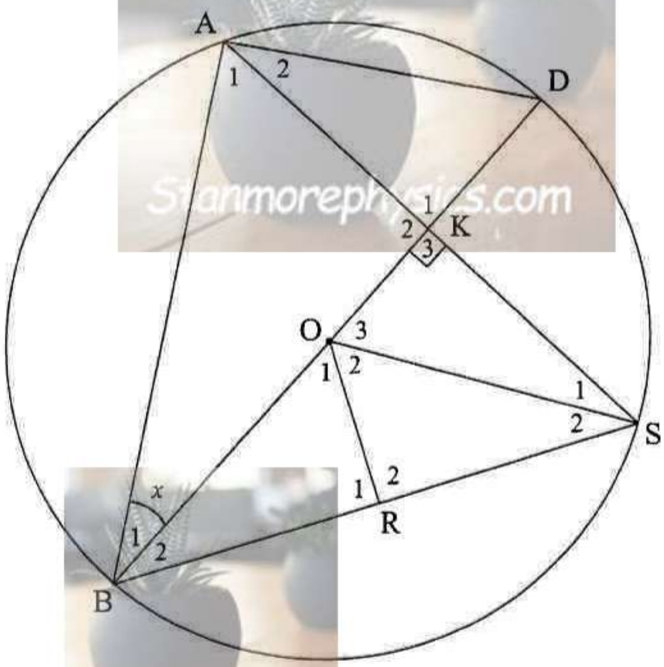

9.2.1 Calculate, with a reason, the size of $\hat{E}_2$. (2)

9.2.2 If it is given that ED = DC, write down, with a reason, the size of $\hat{B}_3$. (2)

9.2.3 Calculate, with reasons, the size of $\hat{A}_2$. (3)
**[12]**

**QUESTION 10**

In the diagram, O is the centre of the circle. Chord AS is perpendicular to diameter BOD at K. OR is drawn with R on BS. AB, AD and OS are drawn. $\hat{B}_1 = x$.




10.1 Complete the following theorem statement:

The angles subtended by a chord at the circumference of the circle, on the same side of the chord, are … (1)

10.2 Determine, with reasons, the sizes of the following angles in terms of $x$:

10.2.1 $\hat{D}$ (3)

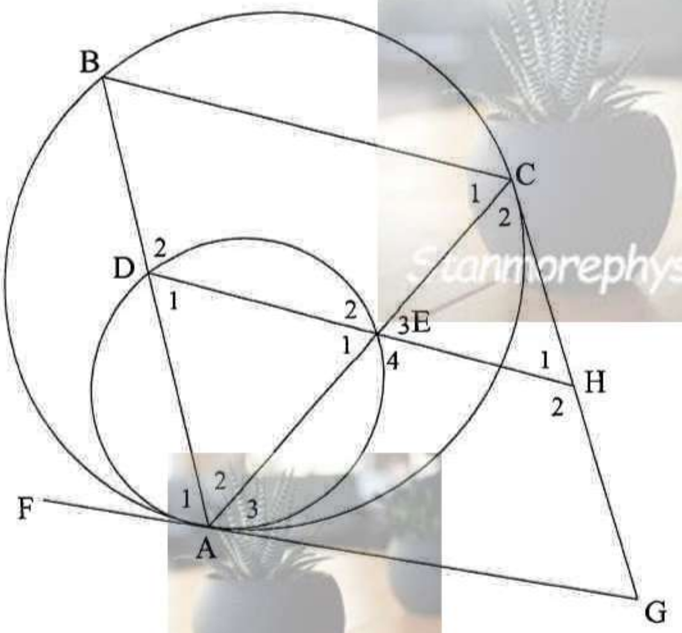
10.2.2 $\hat{B}_2$ (3)

10.2.3 $\hat{S}_1$ (2)

10.3 It is further given that BR = RS. Prove that OKSR is a cyclic quadrilateral. (3)
**[12]**

**QUESTION 11**

In the diagram, FA is a common tangent to circle ABC and circle ADE at A. Chords AB and AC of the larger circle cut the smaller circle at D and E respectively. BC is drawn. Another tangent is drawn from C to intersect FA produced at G. DE produced intersects tangent GC at H.




11.1 Prove that $\Delta ADE \mid\mid\mid \Delta ABC$ (4)

11.2 It is further given that $AD : AB = 1 : 3$ and $AE = 4$ cm. Calculate the length of EC. (4)

11.3 Prove that $\frac{EH}{EC} = \frac{CA}{CB}$ (4)

11.4 Prove that $EC = \sqrt{\frac{EH.CB.DB}{3AD}}$ (5)

[17]

**TOTAL: 150**

# INFORMATION SHEET

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

$A = P(1+ni)$ $\quad$ $A = P(1-ni)$ $\quad$ $A = P(1-i)^n$ $\quad$ $A = P(1+i)^n$

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

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

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

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

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\quad$ $M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$

$y = mx + c$ $\quad$ $y - y_1 = m(x - x_1)$ $\quad$ $m = \frac{y_2 - y_1}{x_2 - x_1}$ $\quad$ $m = \tan\theta$

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

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

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

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

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

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

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

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

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

$P(A) = \frac{n(A)}{n(S)}$ $\quad$ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$\hat{y} = a + bx$ $\quad$ $b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$