



**LIMPOPO**

**PROVINCIAL GOVERNMENT**  
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF**  
**EDUCATION**

**SEKHUKHUNE SOUTH AND EAST DISTRICT**

**GRADE 11**  
**MATHEMATICS**  
**TEST 1**  
**10 MARCH 2020**

MARKS: 100

DURATION: 2 HOURS

**INSTRUCTIONS:**

1. This question paper consists of 5 questions, answer all of them.
2. Diagrams are not necessarily drawn to scale.
3. Number your answers exactly as the questions are numbered.
4. Write neatly and legibly.

**QUESTION 1**

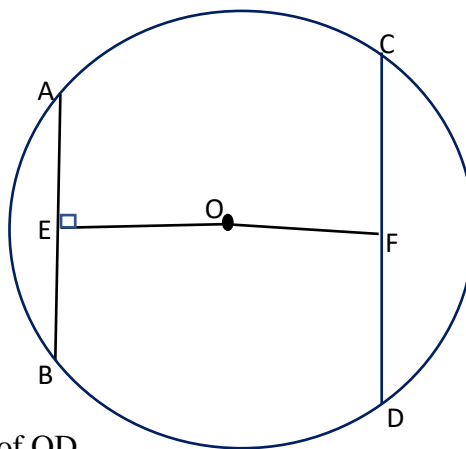
- 1.1 Solve for  $x$  in each of the following:
- 1.1.1  $2x(x - 3) = 0$  (2)
- 1.1.2  $3x^2 - 2x = 4$  (*correct to TWO decimal places*) (5)
- 1.1.3  $(x - 1)(4 - x) \geq 0$  (4)
- 1.1.4  $\sqrt{x + 5} = x - 1$  (5)
- 1.2. Solve for  $x$  and  $y$  simultaneously if: (6)
- $x + 4 = 2y$  and  $y^2 - xy + 21 = 0$
- 1.3 Discuss the nature of the roots of the equation  $2(x - 3)^2 + 2 = 0$  (4)
- 1.4 Determine the value(s) of  $p$  if  $g(x) = -2x^2 - px + 3$  has a maximum value of  $3\frac{1}{8}$ . (4)

**[30]****QUESTION 2**

- 2.1 Simplify fully, WITHOUT using a calculator:  $\frac{3^{2x+1} \cdot 15^{2x-3}}{27^{x-1} \cdot 3^x \cdot 5^{2x-4}}$  (4)
- 2.2 Solve for  $x$
- 2.2.1  $(\frac{1}{2})^x = 32$  (3)
- 2.2.2  $2^x - 5 \cdot 2^{x+1} = -144$  (3)
- 2.2.3  $2 - 16x^{-\frac{3}{2}} = 0$  (3)
- 2.2.4  $\sqrt[3]{9} = 243$  (3)

**[16]****QUESTION 3**

- 3.1 Complete: The line drawn from the centre of the circle perpendicular to the chord ..... (1)
- 3.2 The figure below, AB and CD are chords of the circle with centre O.  $OE \perp AB$ .  $CF = FD$ .  $OE = 4\text{cm}$ ,  $OF = 3\text{cm}$  and  $CD = 8\text{cm}$ .

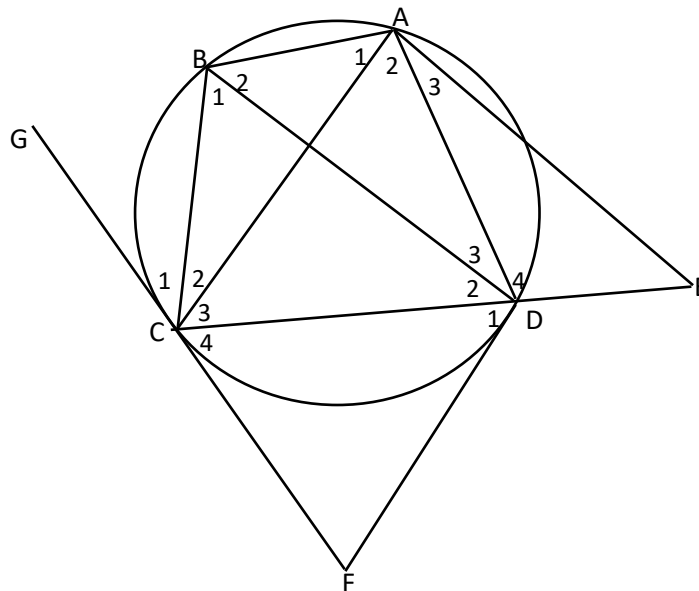


- 3.2.1 Calculate the length of OD. (3)
- 3.2.2 Hence calculate the length of AB. (4)

**[9]**

**QUESTION 4**

In the diagram below, points A, B, C and D lie on the circumference of a circle. FG and FD are tangents to the circle at C and D respectively. CD is produced to meet AE at E. Furthermore,  $\angle GCA = 78^\circ$ ,  $\angle CBD = 41^\circ$  and  $\angle BDA = 34^\circ$



4.1.1 Write down, with reasons, THREE other angles that are each equal to  $41^\circ$  (6)

4.1.2 Determine with reasons the sizes of the following angles:

(a)  $\hat{D}_2$  (3)

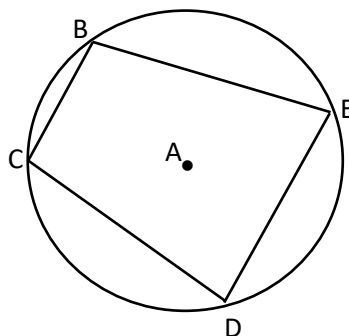
(b)  $\hat{B}_2$  (3)

(c)  $\hat{D}_4$  (3)

(d)  $\hat{F}$  (2)

4.1.3 Determine, with reasons, whether  $CADF$  is a cyclic quadrilateral or not (3)

4.2 In the diagram below, A is the centre of the circle and BCDE is a cyclic quadrilateral. Prove the theorem that states that  $\angle B + \angle D = 180^\circ$

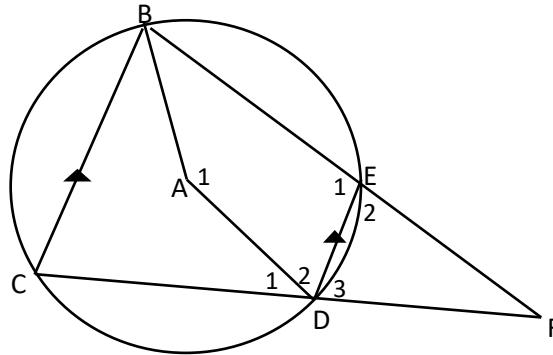


(5)

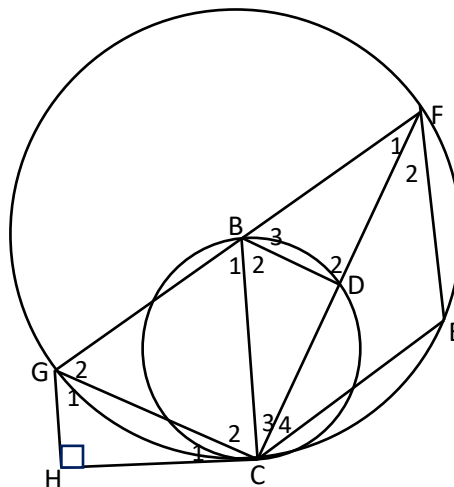
[25]

### QUESTION 5

- 5.1 In the figure, BCDE is a cyclic quadrilateral.  $BC \parallel ED$  in the circle with centre A. BE and CD produced meet at F.  $\angle D_3 = x$ ,



- 5.1.1 Show that  $FE = FD$  (4)  
 5.1.2 If  $\angle D_3 = x$ , determine the value of  $\angle F$ , in terms of  $x$ . (2)  
 5.1.3 Hence, show that BADF is a cyclic quadrilateral (4)
- 5.2 B is the centre of the larger circle CEF. BC is the diameter of the smaller circle CDB. HC is a tangent to both circles at C.  $GH \perp$ ,  $\angle C_1 = x$ .



- 5.2.1 Prove that CG bisects  $\angle BGH$ . (5)  
 5.2.2 Prove that  $\angle GBD = \angle CEF$ . (5)

[25]