

α -MATHEMATICS

Grade 10 Alpha Mathematics Term 3 Test 2021

Examiner: L Liebenberg

Time: 1 hours

Moderator: A Muller

Total: 60

INSTRUCTIONS AND INFORMATION

Read through the following instructions before answering the question paper.

1. This question paper consists of 3 pages and an answer sheet.
2. Answer ALL 4 questions.
3. Number the answers according to the numbering system used in this question paper.
4. Non-programmable calculators may be used, unless otherwise indicated in the question.
5. Unless indicated otherwise, all answers, where necessary, must be given correct to two decimal places.
6. Clearly show all calculations, diagrams, graphs etcetera that you have used in determining the answers.
7. Answers only will not necessarily be awarded full marks.
8. The diagrams are not necessarily drawn to scale.
9. All angles are given in radians. Answers must also be given in radians where necessary.
10. Write neatly and legibly.

Question 1**[4 marks]**

This question must be answered **on the answer sheet**.

Every question has **ONLY** one correct answer for TWO marks each. Mark the correct answer with an **X** on the answer sheet.

1.1 The gradient of a function at a point is called the

- A** integral of the function.
- B** roots of the function.
- C** derivative of the function.
- D** constant of the function.

1.2 The area under a graph or the volume of a solid figure can be determined through the

- A** integral of the function.
- B** roots of the function.
- C** derivative of the function.
- D** constant of the function.

Question 2**[20 marks]**

Differentiate each of the functions with regard to the unknown:

2.1 $f(x) = 5x^6 - \frac{1}{2}x^2 + 7x - 1$ (3)

2.2 $f(a) = 2p^3 - \frac{3}{a} + 5$ (2)

2.3 $f(x) = 3ax^2 + \frac{1}{2}a^3x^4$ (3)

2.4 $f(x) = (3 - x)(2 + 5x + x^2)$ (5)

2.5 $f(x) = \sqrt[4]{16x^3} + \frac{2}{\sqrt{x^4-1}}$ (Make use of the chain rule) (7)

Question 3**[16 marks]**

Determine the following integrals:

3.1 $\int 5x^2 dx$ (2)

3.2 $\int (6x^3 + 2x - 3) dx$ (4)

3.3 $\int \left(\sqrt[4]{x} + \frac{2}{x^2} \right) dx$ (5)

3.4 $\int \frac{1}{\sqrt[5]{(1-2x)^4}} dx$ (5)

Question 4**[20 marks]**Given the functions $f(x) = x^2 - 9$ and $g(x) = -x^2 + 4x + 7$ answer the questions below.

4.1 Determine the area between $f(x)$ and $g(x)$. (10)

4.2 Determine the volume of a solid of revolution formed by rotating $f(x)$ about the x -axis from $x = 1$ to $x = 2$. (10)

- END OF THE QUESTION PAPER -

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Grade 10 Alpha Mathematics Term 3 Test 2021 Answer sheet

Name and Surname: _____

Question Total	1 [4]	2 [20]	3 [16]	4 [20]	TOTAL 60
Learner mark					

Question 1

1.1	A	B	C	D
1.2	A	B	C	D

Table with derivatives

$F(x)$	$F'(x)$
ax^n	nax^{n-1}
$f[g(x)]$	$f'[g(x)] \cdot g'(x)$