

**GRADE 11 MATHEMATICS
NOVEMBER EXAMINATION PAPER 2**

QUESTION 1

1.1 Calculate the following with the use of a calculator:

1.1.1 $\sin 43^\circ + \cos 47^\circ$ (1)

1.1.2 $\tan^2 50^\circ$ (1)

1.1.3 $\cot 33^\circ + \operatorname{cosec} 15^\circ$ (1)

1.2 If $A = 34,3^\circ$ and $B = 22,2^\circ$, calculate the following to two decimal places:

1.2.1 $\sin (A + B)$ (2)

1.2.2 $\sec \left(\frac{A}{2}\right)$ (2)

1.3 Calculate the following without the use of a calculator:

1.3.1 $\sin 30^\circ + \cos 60^\circ$ (1)

1.3.2 $\tan 45^\circ + \cos 45^\circ$ (1)

1.3.3 $\cos 90^\circ + \sin 90^\circ$ (1)

[12]

QUESTION 2

Without the use of a calculator, answer the following questions:

2.1 Given $\cos \theta = -\frac{1}{5}$ and $0^\circ \leq \theta \leq 180^\circ$
Use a diagram to determine the values of:

2.1.1 $\tan (180^\circ + \theta)$ (1)

2.1.2 $3\sin (\theta - 90^\circ)$ (2)

2.2 Simplify the following expression: $\frac{\sin (-230^\circ)}{\cos (240^\circ)} + \frac{\cos (90^\circ)}{\sin (260^\circ + \pi)}$ (5)

2.3 Prove that: $\tan \theta \sqrt{\frac{1}{\sin^2 \theta} - 1} = 1$ (4)

2.4 Determine the general solution for: $3\sin^2 \theta + 1 = \sin \theta$ (6)

[28]

QUESTION 3

3.1 Sketch on the same set of axes the graphs for:

$f(x) = -2\cos x$ and $g(x) = \sin 2x$, for the interval $-90^\circ \leq x \leq 180^\circ$.

Show the coordinates of the turning points and all axis intercepts. (5)

3.2 Study the following sketch and determine the value of $\cos \theta - \cos \phi$, without the use of a calculator.



(5)
[10]

QUESTION 4

In the diagram below, the angle between line AB and the x-axis is β . The angle between line CD and the x-axis is θ . A and D are the x-axis intercept points for lines AB and CD respectively. The coordinates of point B are $(\sqrt{3}, 2)$.

The intercept point E, of lines AB and CD lies on the y-axis. $\angle EDC = 63,69^\circ$

The equation of the line CD is given as: $3x + 2y = 6$



4.1 Determine the coordinates of E. (2)

4.2 Calculate the numerical value of α . (2)

4.3 Calculate the numerical value of β . (2)

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Table of Contents Maths Qution Paper 2014 Nov Grade 11

1. Understanding the eBook Maths Qution Paper 2014 Nov Grade 11
 - The Rise of Digital Reading Maths Qution Paper 2014 Nov Grade 11
 - Advantages of eBooks Over Traditional Books
2. Identifying Maths Qution Paper 2014 Nov Grade 11
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Maths Qution Paper 2014 Nov Grade 11
 - User-Friendly Interface
4. Exploring eBook Recommendations from Maths Qution Paper 2014 Nov Grade 11
 - Personalized Recommendations
 - Maths Qution Paper 2014 Nov Grade 11 User Reviews and Ratings

- Maths Qutation Paper 2014 Nov Grade 11 and Bestseller Lists
- 5. Accessing Maths Qutation Paper 2014 Nov Grade 11 Free and Paid eBooks
 - Maths Qutation Paper 2014 Nov Grade 11 Public Domain eBooks
 - Maths Qutation Paper 2014 Nov Grade 11 eBook Subscription Services
 - Maths Qutation Paper 2014 Nov Grade 11 Budget-Friendly Options
- 6. Navigating Maths Qutation Paper 2014 Nov Grade 11 eBook Formats
 - ePub, PDF, MOBI, and More
 - Maths Qutation Paper 2014 Nov Grade 11 Compatibility with Devices
 - Maths Qutation Paper 2014 Nov Grade 11 Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Maths Qutation Paper 2014 Nov Grade 11
 - Highlighting and Note-Taking Maths Qutation Paper 2014 Nov Grade 11
 - Interactive Elements Maths Qutation Paper 2014 Nov Grade 11
- 8. Staying Engaged with Maths Qutation Paper 2014 Nov Grade 11
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Maths Qutation Paper 2014 Nov Grade 11
- 9. Balancing eBooks and Physical Books Maths Qutation Paper 2014 Nov Grade 11
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Maths Qutation Paper 2014 Nov Grade 11
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Maths Qutation Paper 2014 Nov Grade 11
 - Setting Reading Goals Maths Qutation Paper 2014 Nov Grade 11
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Maths Qutation Paper 2014 Nov Grade 11
 - Fact-Checking eBook Content of Maths Qutation Paper 2014 Nov Grade 11
 - Distinguishing Credible Sources

13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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