

**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:  $\frac{\sin(-230^\circ)}{\cos(240^\circ)} + \frac{\cos(190^\circ)}{\sin(260^\circ + \pi)}$  (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  $\beta$ . The angle between line CD and the x-axis is  $\theta$ . 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  $\alpha$ . (2)

4.3 Calculate the numerical value of  $\beta$ . (2)

# Memorandum November 2013 Mathematics Paper Grade 11

**Jicheng Xie**



## **Memorandum November 2013 Mathematics Paper Grade 11:**

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