



DEPARTMENT OF
EDUCATION

UPPER SECONDARY
SCHOOL
CERTIFICATE
EXAMINATIONS

GENERAL
MATHEMATICS

Paper 1

Monday

17th October 2011

Time allowed:

2 hours and 30 minutes

(8:00am – 10:30 am)

NO EXTRA TIME

(NO OTHER TIME)

Candidates are advised to
fully utilise the allocated
time

M G 1

INSTRUCTIONS TO CANDIDATES

To be read by the external invigilator to all candidates

1. The code for General Mathematics is **4**
2. There are **8** printed pages in the question booklet and **4 printed** pages in the Section B answer booklet. A **1 printed page** formula sheet is also inserted in the centre.
3. There are two sections in this paper. Answer all questions.

Section A: Multiple Choice Questions - 30 marks

This section will be electronically marked.

Electronic Answer Sheets will be distributed by your external invigilator. All answers to the Multiple Choice Section **MUST** be answered on this Answer Sheet.

Carefully following the instructions, fill in your Candidate Information and Subject Information.

Section B: Short Answer Questions - 20 marks

Write down your name, your school name and your 10 digit candidate number on the Section B Answer Sheet Provided.

4. You are required to only write the correct answer in the space provided.
5. Calculators may be used.
6. Answers written on the question paper will not be marked. Write answers neatly in spaces as allocated on the answer sheet. Answer **ALL** questions.
7. Answer all questions on the answer sheet. Answers on any other paper including rough work paper and the question paper **will not be marked**
8. **ALL** working must be shown step by step to get full marks. Students may lose marks for writing down final answers only.
9. Enough spaces have been allocated for answers to every question. Questions must be answered in spaces as allocated. Answers all over the answer booklet may not be marked.
10. Correctional Fluid is **not allowed** on the answer sheet. Where you have made an error, cross out all the working and start on a new line.
11. Graphical Calculators are **not permitted**.

Penalty For Cheating Or Assisting To Cheat In National Examinations Is Non-Certification.

**DO NOT TURN OVER THE PAGE AND DO NOT WRITE
UNTIL YOU ARE TOLD TO START.**

SECTION A: (Questions 1 to 25) : 1 mark each

Answer each question by shading in with HB pencil, the circle directly under the correct alternative A, B, C, D or E. If you make a mistake, rub it out completely using an eraser rubber and shade the correct answer on the Electronic Answer Sheet.

QUESTION 1

$7^x = 342$. What is the approximate value of x ?

- A. 49
- B. 4
- C. 3
- D. 2

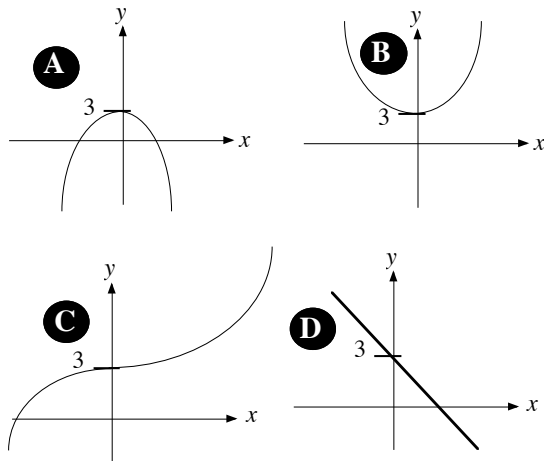
QUESTION 2

The expression $\frac{2}{\sqrt{3}} - \frac{\sqrt{2}}{3}$ is equivalent to

- A. $\frac{2-\sqrt{2}}{3\sqrt{3}}$
- B. $\frac{2\sqrt{3}-\sqrt{2}}{3}$
- C. $\frac{6-\sqrt{2\sqrt{3}}}{3\sqrt{3}}$
- D. $\frac{2}{3}$

QUESTION 3

Which graph correctly represents $y = 3 - x^2$?



QUESTION 4

A map has a scale of 1:50 000. Two towers are 10.4 km apart.

How many centimetres on the map is this?

- A. 2.08
- B. 20.8
- C. 208
- D. 2080

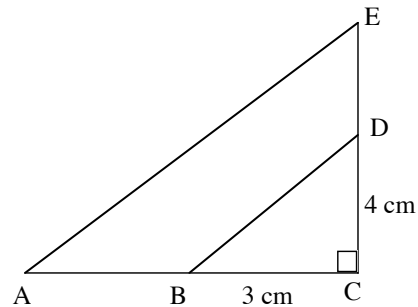
QUESTION 5

What is the size of each of the exterior angles of a regular octagon?

- A. 360°
- B. 180°
- C. 90°
- D. 45°

QUESTION 6

The diagram below shows two triangles drawn from the same perpendicular lines.



If the length $AE = 20$ cm, find the length AB in centimetres.

- A. 20
- B. 12
- C. 9
- D. 8

QUESTION 7

Which of these quadrilaterals can be constructed using four congruent triangles?

- A. rectangle
- B. trapezium
- C. kite
- D. rhombus

QUESTION 8

On a particular trading day, Australian dollar (AUD) buys PGK 2.4276.

How much is PNG Kina is AUD\$ 750?

- A. 309
- B. 1,231

- C. 1736 D. 1,821

QUESTION 9

Peter receives a gross weekly wage of K543.65. His weekly deductions are, tax K122.00, union fees K5.50, medical insurance K9.80 and superannuation K27.50.

Calculate his net weekly pay.

- A. K162.80 B. K378.85
C. K394.15 D. K543.65

QUESTION 10

A shoe repairer charges K7.50 for minor repairs and K14.50 for major repairs. Calculate his fortnightly wage, if in one week he consistently completes 15 major repairs and 24 minor repairs.

- A. K217.50 B. K420.00
C. K637.50 D. K795.00

QUESTION 11

For the data set $\{6,2,14,19,7,11,18,24,16,10\}$, what is the range?

- A. 24 B. 22
C. 13 D. 6

QUESTION 12

If the 50th and 60th percentiles of a dataset of 150 values are 27 and 33 respectively, an estimate of the 55th percentile is :

- A. 100 B. 82.5
C. 55 D. 30

QUESTION 13

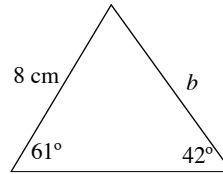
If the ordered frequencies of the classes in a frequency distribution are 12, 17, 28, 33, 30, 27, 22, 15, 6 and 1, what is the cumulative frequency for the fifth class?

- A. 5 B. 90

- C. 120 D. 147

QUESTION 14

The diagram shows a triangle with the sides and angles as given.

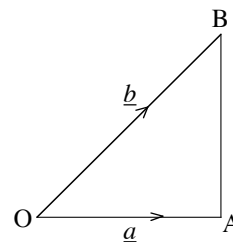


Calculate the length b in centimetres correct to 2 decimal places.

- A. 10.46 B. 10.45
C. 10.43 D. 9.00

QUESTION 15

In the figure



- A. $\underline{a} + \underline{b}$ B. $\underline{a} - \underline{b}$
C. $\frac{1}{2}\underline{a} + \frac{1}{2}\underline{b}$ D. $\underline{b} - \underline{a}$

QUESTION 16

A sphere has a radius of 15 cm. What is its approximate volume in cm^3 ?

- A. 14,136 B. 14,137
C. 14,138 D. 14,139

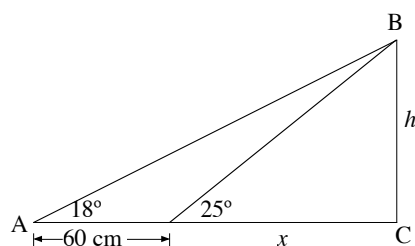
QUESTION 17

What is the compounded amount for K1 000 deposited at 12.50% p.a compounded monthly after two years?

- A. K1,129.62 B. K1,276.03
C. K1,020.52 D. K40,001.62

QUESTION 18

Refer to the following diagram.



Which of the statements is NOT TRUE about h in the diagram above?

- A. $h = x \cdot \tan 25^\circ$ B. $h = x \cdot \sin 18^\circ$
 C. $h = x \cdot \tan 43^\circ$ D. $h = x \div \cos 65^\circ$

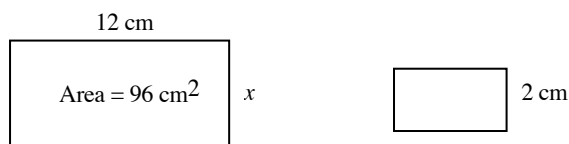
QUESTION 19

A map has a scale of 1:25,000. How many kilometres in actual distance is represented by the length 6.8 cm on the map?

- A. 170,000 B. 170
 C. 17 D. 0.17

QUESTION 20

The two rectangles below are similar.



Find the area of the small rectangle in cm^2 ?

- A. 6 B. 8
 C. 12 D. 16

QUESTION 21

A car costing K25,000 depreciates 30% of its value each year. What is the book value at the end of 3 years?

- A. K11,379.15 B. K8,575.00
 C. K17,500.00 D. K5,833.33

QUESTION 22

If the cost of living rises 8% a year.

What will be the value of a packet of rice now costing K5.00 be in five years time?

- A. K4.00 B. K7.35
 C. K7.80 D. K8.32

QUESTION 23

If a card is drawn at random from a standard pack of playing cards, the probability that it is a red is

- A. $\frac{1}{26}$ B. $\frac{1}{13}$
 C. $\frac{1}{4}$ D. $\frac{1}{2}$

QUESTION 24

What is the probability of getting boys born consecutively to a family?

- A. 0.75 B. 0.5
 C. 0.25 D. 0.20

QUESTION 25

Study the sequence below.

1, 4, 9, 16, _ , _ , P, Q, ...

Find half of Q subtracted from P.

- A. 64 B. 49
 C. 32 D. 17

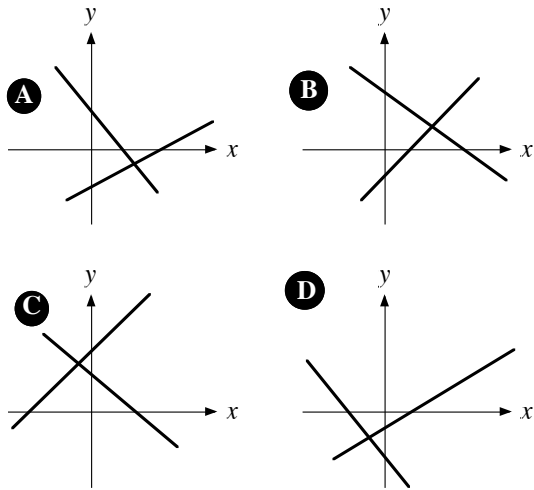
QUESTION 26

Convert $\frac{\pi}{4}$ radians to degrees.

- A. 25° B. 35°
 C. 45° D. 55°

QUESTION 27

A possible graphical solution of the linear simultaneous equations $y + 2x - 1 = 0$ and $2y - 3x + 5 = 0$ is given by:



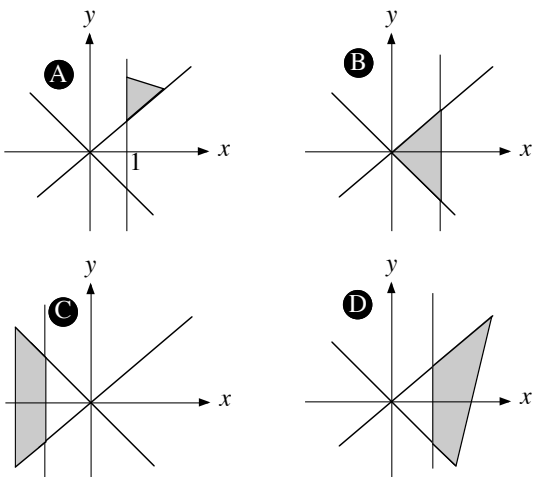
QUESTION 28

Find the value of x if $3^{x+2} = \frac{1}{27}$.

- A. $x = 1$ B. $x = -3$
- C. $x = -5$ D. $x = 3$

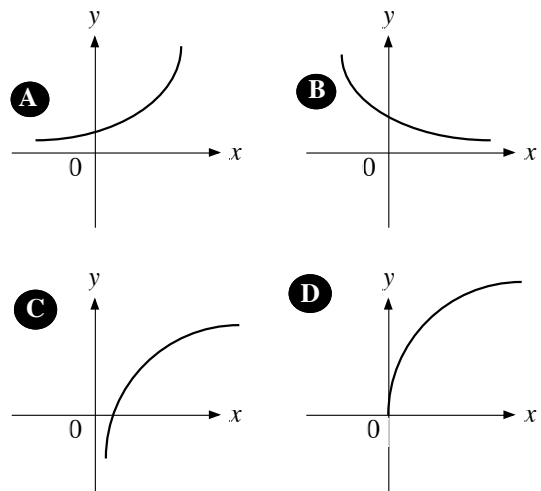
QUESTION 29

The solution region for the following inequalities is given by $x + y \geq 0$, $x - y \leq 0$ and $x \geq 1$



QUESTION 30

Which of the following represents the graph of $y = a^x, a > 1$



SECTION B: SHORT ANSWERS

(QUESTIONS 31 TO 50)

Carefully work out your answers and write down your final answers only in the space provided on your Section B Answer booklet.

QUESTION 31

What is the vertical asymptote of the hyperbola $y = 3 - \frac{1}{x-1}$?

QUESTION 32

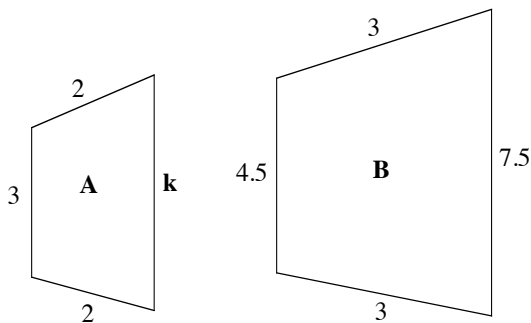
A cube has a total surface area of 96 m^2 . Find the length of each of its sides.

QUESTION 33

Calculate the cost of buying 700 BSP shares at K0.71 each with brokerage of 2.5%.

QUESTION 34

Find the value of k, given that figures A and B are similar.

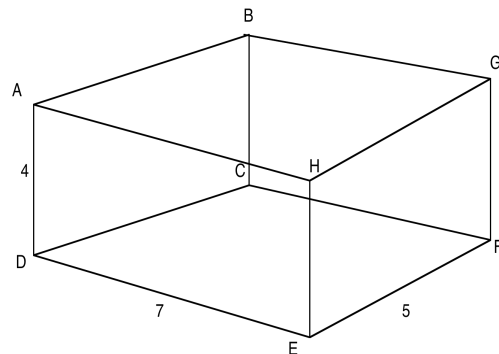


QUESTION 35

Find the volume of a sphere with the radius of 12 cm.

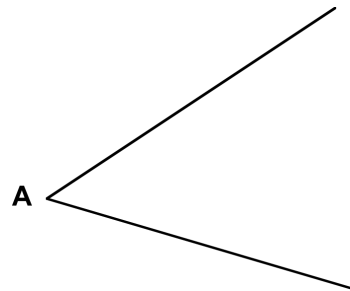
QUESTION 36

Find the angle between lines DG and DF



QUESTION 37

Use a protractor to measure the acute angle A. What is half of this acute angle A?

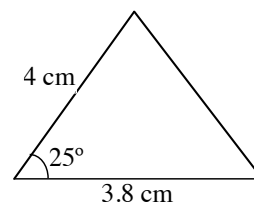


QUESTION 38

Find the distance between the points P (3,4) and B (1,3).

QUESTION 39

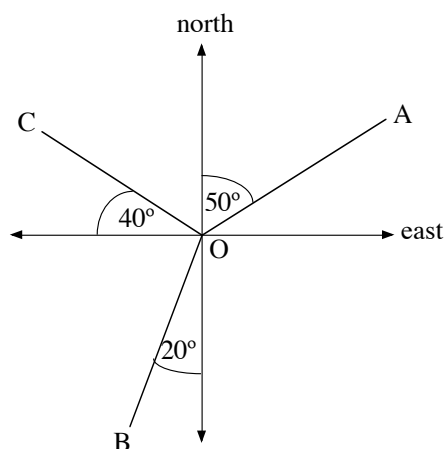
Determine the area of the following triangle.



Give answer to two significant figures.

QUESTION 40

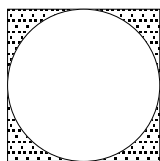
The diagram below shows the compass direction of 3 places from O.



What is the bearing of C from O.

QUESTION 41

The diagram shows a circle inscribed in a square.



What is the radius of the circle if the area of the square is 625 cm^2 ?

QUESTION 42

If the quartiles of a dataset are 345, 678 and 822, calculate the inter quartile range.

QUESTION 43

A person used a credit card to obtain a cash advance of K400 on 20 January. His next statement date was 3 February. He made a payment of K200 to the account on 21 February. If the interest rate is 15.6% p.a, how much interest due to the cash advance would appear on the 3 February statement.

QUESTION 44

If a 20 toea coin and a fair die are tossed, what is the probability that a cassowary will appear and the number appearing on the die will be less than 3?

QUESTION 45

For the following frequency distribution, to which side is the distribution skewed:

Class	Frequency
0 to 50	23
51 to 100	47
101 to 150	81
151 to 200	144
201 to 250	196
251 to 300	211
301 to 350	105
351 to 400	72

QUESTION 46

Calculate the interest paid for a personal loan of K10 000 over 4 years with monthly repayments of K262.90 and a fee of K150.

QUESTION 48

A car-hire company charges the following rates for one of its hire cars.

Toyota Landcruiser			
Daily Hire Cost			
1 day	2 – 6 days	7- 13 days	14 + days
K700	K650	K600	K500
Plus K0.20 per km			

Calculate the cost of hiring a landcruiser for 5 days if you cover a total of K1245 km.

QUESTION 49

Frank buys a lounge suite from courts warehouse for K1750 including GST (Goods and service tax). What was the GST paid?

QUESTION 50

Rupai was paid K60,000.00 as dividend for 2,000,000 shares.

How much was the dividend per share.

END OF EXAMINATION