



DEPARTMENT OF EDUCATION

LOWER SECONDARY SCHOOL CERTIFICATE EXAMINATIONS

MATHEMATICS

Tuesday

30th September 2014

Time allowed: 3 hours

Candidates are advised to
fully utilise the time
allocated

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INSTRUCTIONS TO CANDIDATES:

(To be read out by the External Invigilator before the start of the examination)

There are **45** questions in this paper worth **1 mark each** and **1** question worth **5 marks**. Attempt ALL questions, even if you are not sure of some of the answers.

The Examination is divided into three parts:

| | | |
|----------------|--|-----------------|
| PART A: | Multiple Choice (Questions 1 to 25) | 25 marks |
| PART B: | Short Answers (Questions 26 to 45) | 20 marks |
| PART C: | Extended Response (Question 46) | 5 marks |

The Answer Sheet is part of the Examination Booklet. Take out the middle pages and remove the Answer Sheet by tearing along the perforation. You may use the blank sheet for rough work.

Write your province code, school code candidate number, name and school name in the space given on the **Answer Sheet**.

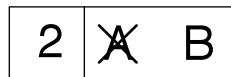
For each question in **PART A** choose the best answer and write its LETTER in the space given on the **Answer Sheet**.

For each question in **PART B** and **PART C** work out the answer and write the answer in the spaces provided on the **Answer Sheet**.

If you find a question very difficult, do not spend too much time thinking about it. Leave the question out and go on with the rest of the paper. If you have time at the end, return to the difficult questions and think about them more carefully.

Write your answers in **BLUE** or **BLACK** ink (pen or biro).

If you decide to change an answer, make your correction as shown below so that it is clear to the markers what your final answer is. Do NOT use correction fluid on your answer sheet.



Hand in **BOTH** the Answer Sheet and the papers used for rough work at the end of the examination.

THE PENALTY FOR CHEATING OR ASSISTING OTHERS TO CHEAT IN NATIONAL EXAMINATIONS IS NON-CERTIFICATION.

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

PART A (Questions 1 to 25) : 1 mark each.

For each question choose the best answer by writing A, B, C or D in the space provided on the ANSWER SHEET

QUESTION 1

A letter is randomly chosen from the letters of the word 'SIMILARITY'.

What is the probability that the letter 'I' will be chosen?

- A. 10 B. 0.3 C. 3 D. 0.1

QUESTION 2

An old man built a model of a canoe with its length the span of his arm. His arm span is 70cm. His grandson builds a canoe 5 times the length of the model. How long is the canoe in meters?

- A. 0.35 B. 3.5 C. 35 D. 350

QUESTION 3

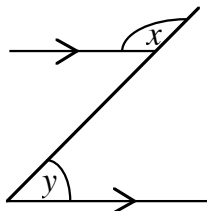
Evaluate; $5 \times 10^4 + 6.3 \times 10^3 - 1.3 \times 10^2$

- A. 5.617×10^2 B. 5.617×10^3
C. 5.617×10^4 D. 5.617×10^5

QUESTION 4

Which algebraic equation is true with regard to the figure below?

- A. $x = y$
B. $x = y - 180^\circ$
C. $x = 180^\circ + y$
D. $x + y = 180^\circ$

**QUESTION 5**

Simplify $\left(\frac{a^5 b^2}{\left(\frac{1}{a^3} \right)} \right)^3$

- A. $a^6 b^6$ B. $a^{24} b^6$
C. $a^8 b^5$ D. ab^5

Question 6 and Question 7 refer to the information given.

Lisa earns K500 per fortnight. The table below shows how he plans to spend his money.

| Item | Percentage (%) |
|--------------|----------------|
| Food | 40 |
| Rent | 20 |
| Leisure | 15 |
| Savings | 10 |
| Transport | 8 |
| Wantoks | 7 |
| Total | 100 |

QUESTION 6

What is Lisa's total expenditure for Food and Rent in kina?

- A. 150 B. 250 C. 200 D. 300

QUESTION 7

What percentage decimal is spent on Wantoks?

- A. 0.007 B. 0.07
C. 0.7 D. 7.0

QUESTION 8

Simplify $\frac{a^2}{t^2} \div \frac{2a^4}{t^2}$ and give your answer in negative indices.

- A. $2^{-1} a^{-6}$ B. $2^{-1} a^{-4}$
C. $2^{-1} a^{-2}$ D. $2^{-1} a^2$

QUESTION 9

If $y = 5x + 1$ and $x + y = 31$, solve for y .

- A. 24 B. 26 C. 28 D. 30

QUESTION 10

A computer cost K3 000. Patrick decides to buy the computer on Hire purchase. He made K600 deposit and agreed to pay the rest in monthly instalments of K120 over a period of 2 years.

How much interest will he pay?

- A. K120
- B. K480
- C. K240
- D. K2 880

QUESTION 11

Jessie bought a material worth K10 and sewed a meri blouse. She put a mark up of 60%. After being on display for 2 weeks she decided to reduce the price by K2.

How much did she eventually sell the meri blouse for?

- A. K16
- B. K14
- C. K12
- D. K10

QUESTION 12

The sides of an isosceles triangle are $2a$, $(2a + 2)$ and $(2a + 2)$ centimetres.

What is the algebraic expression of the perimeter of this triangle?

- A. $3a + 8$
- B. $6a + 4$
- C. $6a + 2$
- D. $4a + 2$

QUESTION 13

At present Mary is four years younger than her brother Tom. If Tom is n years old, what will be the sum of their age in three years time?

- A. $4n + 1$
- B. $2n + 1$
- C. $2n + 2$
- D. $2n + 2$

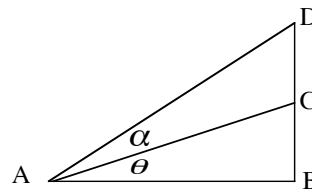
QUESTION 14

Solve for y in, $4 + 2(3y - 1) = -4$

- A. $-1\frac{1}{6}$
- B. -1
- C. $\frac{1}{9}$
- D. 3

QUESTION 15

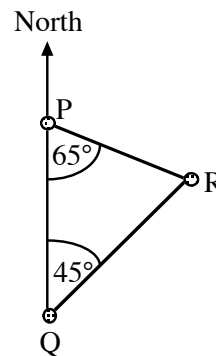
Which of the following alternatives is true about $\angle CAB$?



- A. $\tan \theta = \frac{BC}{AB}$
- B. $\tan \theta = \frac{AB}{BC}$
- C. $\tan(\theta + \alpha) = \frac{BD}{AB}$
- D. $\tan(\theta + \alpha) = \frac{AB}{BD}$

QUESTION 16

Points P, Q and R represent 3 locations.



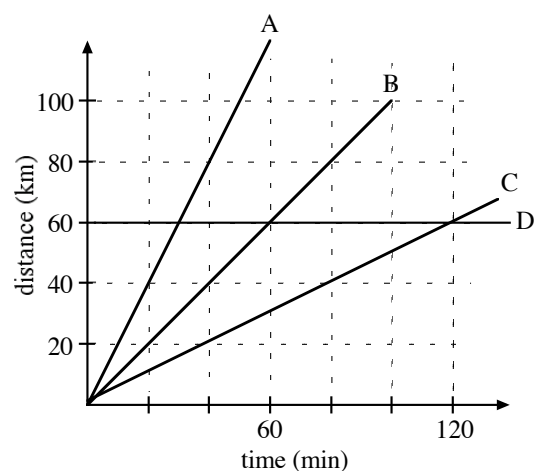
What is the bearing of Q from R?

- A. N45°W
- B. S45°W
- C. N20°W
- D. N45°E

QUESTION 17

The average speed of a small boat travelling in the open sea is 60 kilometres per hour.

Which graph indicates the speed of the boat?



QUESTION 18

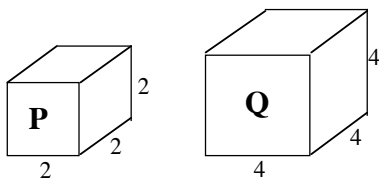
Forty teachers attended a workshop in Port Moresby. 60% of the teachers came in from other provinces while the rest were from the National Capital District (NCD). Out of the NCD teachers, 25% were from Gordon Secondary School.

How many teachers were from Gordon Secondary School?

- A. 4 B. 6 C. 16 D. 24

QUESTION 19

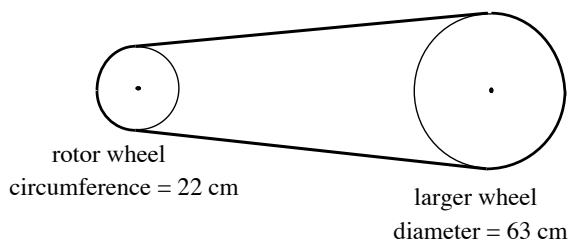
What is the ratio of the volume of cube P to cube Q?



- A. 1:8 B. :1 C. 1:2 D. 2:1

QUESTION 20

Shown is a belt connected between two wheels. The small rotor wheel is driven by power, which then spins the larger wheel.



The circumference of the rotor wheel is 22cm and the diameter of the larger wheel is 63cm.

How many revolutions are required of the rotor wheel to spin the larger wheel twice?

- A. 9 B. 12 C. 15 D. 18

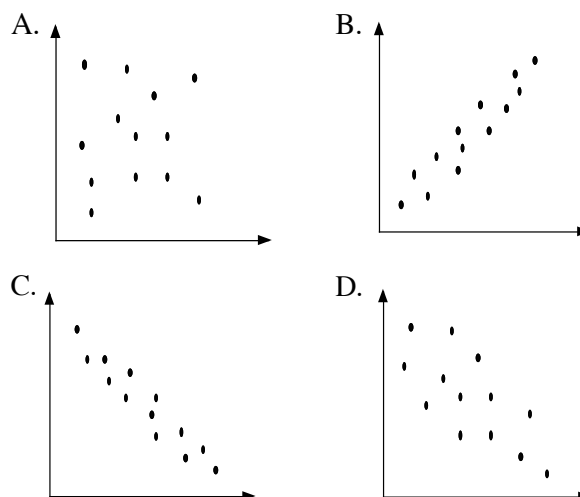
QUESTION 21

Simplify; $-3x(6y^2z - 2xy + 4x) + 2x^2$

- A. $-18xy^2z + 6x^2y - 12x^2$
 B. $-18xy^2z + 6x^2y + 12x^2$
 C. $-18xy^2z + 6x^2y - 10x^2$
 D. $-18xy^2z + 6x^2y + 10x^2$

QUESTION 22

Which of the graphs shows a “strong negative correlation?”



QUESTION 23

A line passing through the origin also passes through the point (5,10)

What is the gradient of this line?

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

QUESTION 24

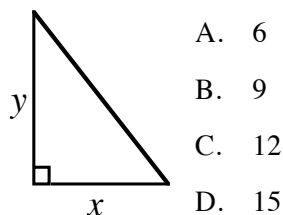
Which pair of equations below shows lines that are parallel?

- A. $y = -\frac{4}{5}x + 4$ and $y = 4$
 B. $y = \frac{4}{5}x + 4$ and $y = -4$
 C. $y = 5$ and $y = 3$
 D. $y = \frac{3}{2}x$ and $y = 2$

QUESTION 25

The area of the triangle shown is 54cm^2 . The ratio of side x to side y is 3:4.

What is the length of side x in centimetres?



- A. 6
 B. 9
 C. 12
 D. 15

PART B: (Questions 26 to 45) 1 mark each.

Work out your answer and write it in the spaces provided on the ANSWER SHEET

QUESTION 26

A dripping tap has water leaking from it at a rate of 30mL per minute.

How long in minutes will it take to fill a 750mL container placed under it?

QUESTION 27

Convert 520 centimetres to kilometres.

QUESTION 28

Calculate the new value if 150 is increased by 150%.

QUESTION 29

Calculate 12.5% of 480.

QUESTION 30

Jonah sold a mobile for K144.00, which is a 10% discount on the Buying Price.

What was the Buying Price in Kina?

QUESTION 31

A salesman is paid 5% commission on the value of every car he sells.

How much commission does he receive from the sale of a car worth K120 000.00?

QUESTION 32

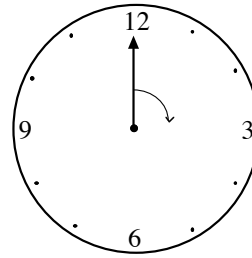
Andrew had a collection of old stamps worth K500. The value of the collection appreciates at 10% per annum.

What will be the value of the old stamps after 2 years?

QUESTION 33

Write, $2x(x - 2) - 4(x - 2)$ in the form $ax^2 + bx + c$.

Question 34 and Question 35 refer to the diagram of a clock face showing only the minute hand.

**QUESTION 34**

By how many degrees does it rotate when the minute hand swings from 12 to 5?

QUESTION 35

When the minute hand makes 0.75 revolutions starting from 12, on what number will it end?

Question 36 and Question 37 refer to the information given.

A number of students were asked what their favourite colour was and the result was tabulated.

| Colour | Number of Students |
|--------|--------------------|
| Red | 4 |
| Blue | 10 |
| Green | 8 |
| Yellow | 2 |
| Pink | 6 |

QUESTION 36

What percentage of students interviewed preferred the colour Pink?

QUESTION 37

How many more students preferred Blue to Red?

QUESTION 38

The mean of four numbers is 5.5. A fifth number is added giving a new mean of 6.

What is the fifth number?

Question 39 and Question 40 refer to the information given.

The test marks scored by students in a class are tabulated as shown.

| | | | | | | | | |
|--------------------|---|---|---|----|---|---|---|----|
| Marks scored | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number of students | 2 | 4 | 8 | 10 | 7 | 6 | 2 | 1 |

QUESTION 39

What fraction of students scored below the modal mark?

QUESTION 40

Which mark was scored by 20% of the students?

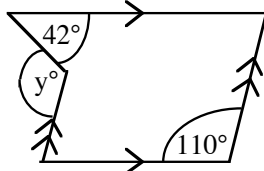
QUESTION 41

From a standing position I walk north 10m, then East 3m before turning and walking south 6m where I come to a stop.

From my final position how far will I be from my starting point?

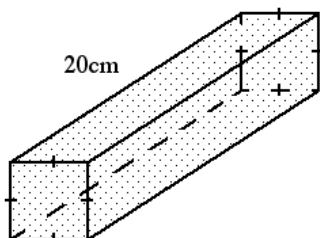
QUESTION 42

Calculate angle y .



QUESTION 43

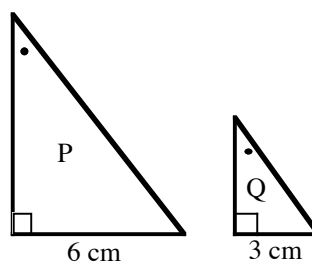
The volume of the prism shown is 500 cm^3 .



What is the total surface area of the prism?

QUESTION 44

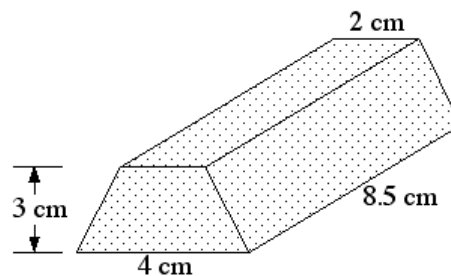
Study the two triangles. Triangle P has an area of 24 cm^2



What is the area of triangle Q?

QUESTION 45

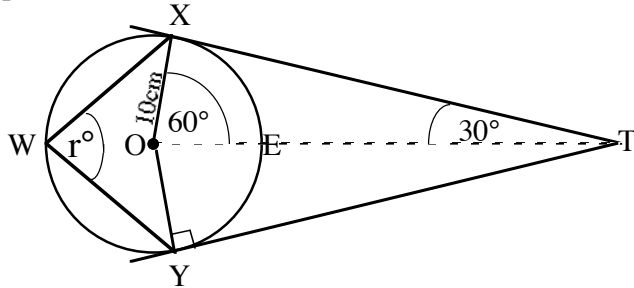
Calculate the volume of the solid shown.



PART C: Question 46 5 marks

For each question work out the correct answer and write it in the space provided on the ANSWER SHEET

Refer to the figure and table given and answer questions 46 to 50.



| Angle | Sine | Cosine | Tangent |
|-------|------|--------|---------|
| 30 | 0.5 | 0.87 | 0.58 |
| 60 | 0.87 | 0.5 | 1.73 |

- (a) Find the length OT in centimetres to the nearest whole number.
- (b) Is triangle OXE *scalene*, *equilateral* or *isosceles*?
- (c) Calculate the area of the triangle OXE in square centimetres using the formula $A = \frac{1}{2}ab \sin C$ correct to 2 decimal places
- (d) Calculate the angle r .
- (e) Calculate the circumference of the circle in square centimetres correct to 1 decimal place.

THE END