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0178/03

October/November 2018

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic Calculator
Geometrical Instruments
Tracing Paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number on all the work you hand in.
Write in dark blue or black pen.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

If working is needed for any question it must be shown below that question.

Electronic calculators should be used.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π use either your calculator value or 3.142.

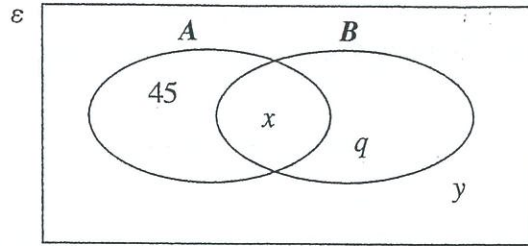
The number of marks is given in brackets [] at the end of each question or part question. The total marks for this paper is 100.

This document consists of **15** printed pages and **1** blank page.



[Turn over

- 1 Given that $n(\varepsilon) = 150$, $n(A) = 75$ and $n(B) = 35$.



- (a) Find the value of

(i) x ,

Answer (a)(i) [1]

(ii) y .

Answer (a)(ii) [2]

(b) Find

(i) $n(A \cup B)$,

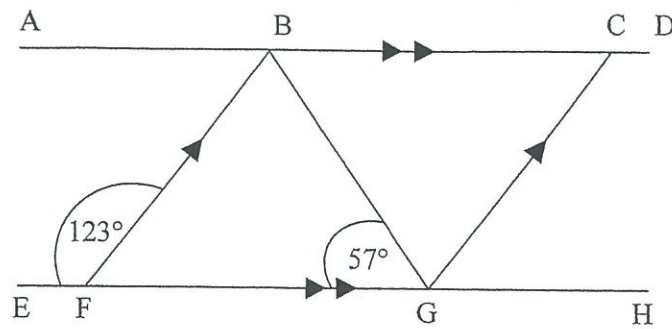
Answer (b)(i) [1]

(ii) $n(A' \cup B)$,

Answer (b)(ii) [2]



- 2 In the diagram, AD is parallel to EH , and BF is parallel to CG .
Angle $BFE = 123^\circ$ and angle $BGF = 57^\circ$.



- (a) Find the size of angle BFG .

Answer (a) $^\circ$ [1]

- (b) Calculate the size of angle BGC and give a reason for your answer.

Answer (b) $^\circ$ Reason: [2]

- (c) Calculate the size of angle BCG and hence, write a special name for triangle BGC .

Answer (c) $^\circ$ Name: [2]



- 3 Pule travels between Lesotho and Ireland at a time when the exchange rate is 1 Euro = M14.84.
- (a) He changes M8 200 to Euros and the bank deducts 1% commission.

(i) How much commission, in Maloti, does the bank deduct?

Answer (a)(i) M [1]

(ii) After the commission is deducted, work out how many Euros Pule receives.

Answer (a)(ii) € [2]

- (b) Pule arrives in Ireland at 0200 after a journey of 11 hours from Lesotho. At this time, the local time in Lesotho is 0400.

(i) Write 0200 hours in a 12-hour clock.

Answer (b)(i) [1]

(ii) Find the Lesotho local time at which Pule departed for Ireland.

Answer (b)(ii) [2]

- 4 (a) Find the value of $a^3 + 3b^2$ when $a = 2$ and $b = -2$.

Answer (a) [2]

- (b) Expand and simplify

$$3x^4 \times (2x^3)^2$$

Answer (b) [2]

- (c) Factorise completely.

$$x^2 - 25y^2$$

Answer (c) [2]

- (d) Make t the subject of the formula.

$$tc + d = 7$$

Answer (d) $t =$ [2]



- 5 (a) A car costs M120 000.
 Limpho buys the car on hire purchase.
 He pays 40% deposit and M1 365 each month for 60 months.

(i) Find the amount of deposit paid.

Answer (a)(i) M [1]

(ii) How much more does Limpho pay for the car on hire purchase than the actual cost.

Answer (a)(ii) M [2]

(iii) Calculate the percentage rate per year of simple interest Limpho is charged on hire purchase for this car.

Answer (a)(iii)% [3]

- (b) Thabo invests M8 000 at the rate of 12.8% **simple interest** per year.
 He receives M5 120 interest after t years.

Find t .

Answer (b) [3]

- (c) Lisebo invests M56 000 at a rate of 12% **compound interest** per year.

Find the **interest** earned after 2 years.

Answer (c) [3]



- 6 On the 1st January 2000, Tau was x years old, Pitso was 5 years older than Tau while Neo was twice as old as Tau.

(a) Write down expressions, in terms of x , for the ages of Pitso and Neo on the 1st January 2000.

Answer (a) Pitso

Neo [2]

(b) The relationship between the ages of the three boys is given by the equation

$$x^2 - 4x - 21 = 0$$

(i) Solve $x^2 - 4x - 21 = 0$.

Answer (b)(i) [3]

(ii) State Tau's age on the 1st January 2000:

Give a reason for the choice of your answer.

Answer (b)(ii) Tau's age

Reason

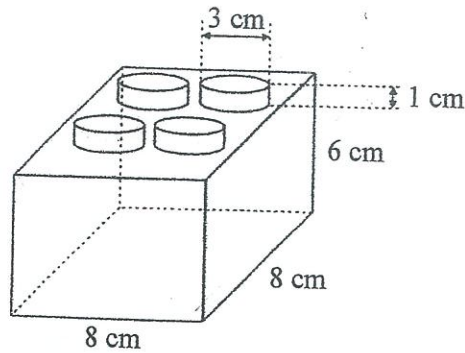
..... [2]

(iii) How old is Pitso on the 1st January 2002?

Answer (b)(iii) [1]



- 7 The diagram shows a solid model made up of a cuboid and four identical cylinders. The cuboid measures 8 cm by 8 cm by 6 cm while each cylinder has a diameter of 3 cm and a height of 1 cm.



(a) State

- (i) the number of edges of the cuboid,

Answer (a)(i) [1]

- (ii) the number of faces on the top of the cuboid.

Answer (a)(ii) [1]

(b) Calculate

- (i) the volume of the cuboid,

Answer (b)(i) cm^3 [2]

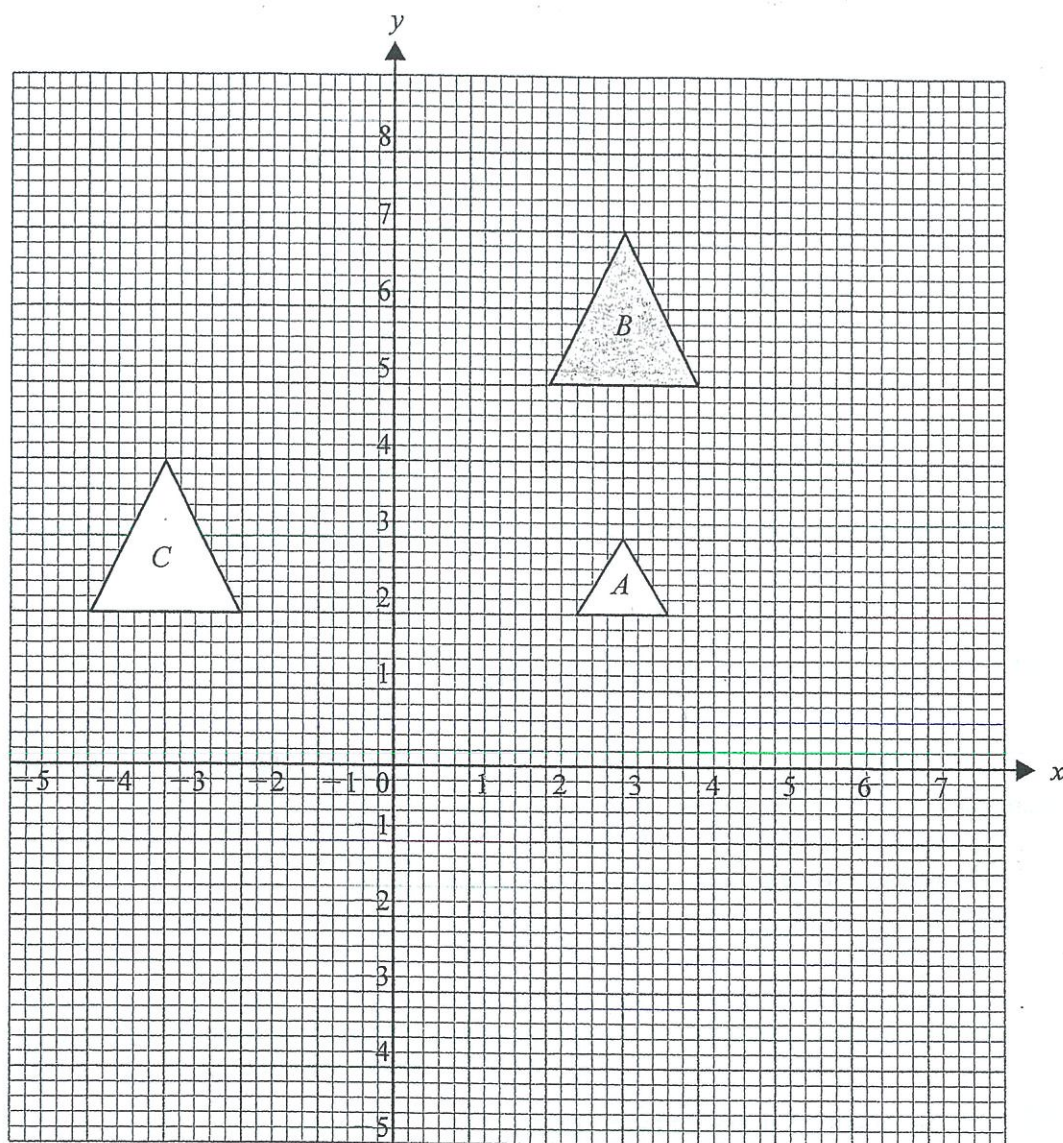
- (ii) the area of the top of one of the cylinders,

Answer (b)(ii) cm^2 [2]

- (iii) the total surface area of the model.

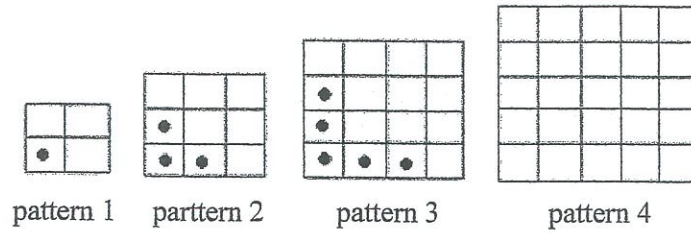
Answer (b)(iii) cm^2 [4]

- 8 The diagram shows triangles A , B and C .



- (a) (i) Plot and label the point $T(5, 7)$ on the grid. [1]
- (ii) Rotate the point T through 90° clockwise about the origin.
Label the image T' . [2]
- (b) Describe fully a **single** transformation that maps
- (i) triangle B onto triangle A ,
..... [3]
- (ii) triangle B onto triangle C .
..... [2]
- (c) On the grid, draw the reflection of triangle B in the line $y = 2$. [2]

- 9 The diagram shows patterns with dotted and plain tiles.



- (a) Complete the 4th pattern.

[1]

- (b) Complete the table below.

Pattern Number	1	2	3	4	5
Dotted tiles	1	3	5		
Plain tiles	3	6	11		

[2]

- (c) Write an expression, in terms of n , for the number of dotted tiles in the n th pattern.

Answer (c) [2]

- (d) Find the number of dotted tiles in the 20th pattern.

Answer (d) [1]

- (e) How many more dotted tiles are in pattern $n + 7$ than in pattern n ?

Answer (e) [2]

- (f) Write an expression, in terms of n , for the number of plain tiles in the n th pattern.

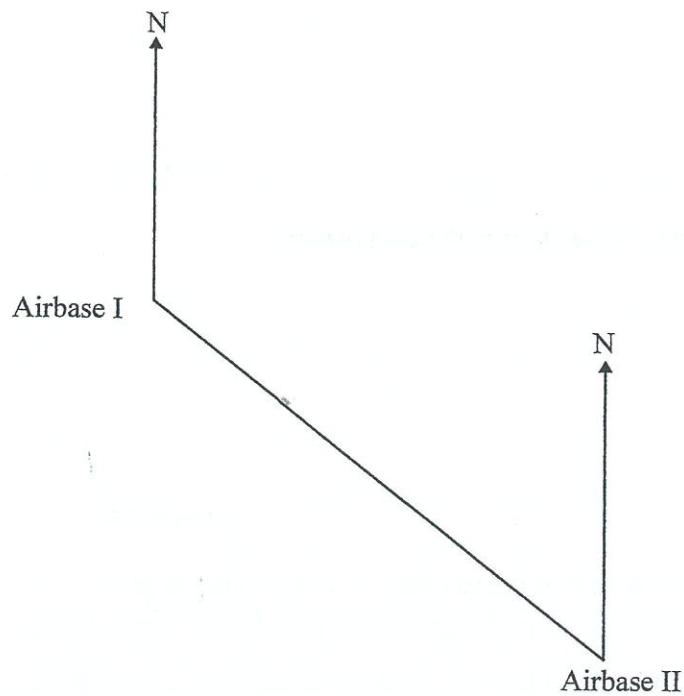
Answer (f) [2]

- (g) Find the pattern with 227 plain tiles,

Answer (g) [2]

- 10 The diagram shows the position of two airbases, Airbase I and Airbase II.

The scale: 1 cm to 5 km.



(a) A helicopter flies from Airbase I to Airbase II.

(i) Measure the bearing of Airbase I from Airbase II.

Answer (a)(i) [2]

(ii) Find the **actual** distance between Airbase II and Airbase I.

Answer (a)(ii) km [2]

(b) The helicopter takes 5 minutes to fly from Airbase I to Airbase II.

Calculate the average speed of the helicopter in kilometres per hour.

Answer (b) km/h [3]

(c) The pilot takes 38 minutes to walk from Airbase II to his home. He arrives at his home at 6.17 pm.

Find the time, in a 24 hour clock, at which he left the Airbase II.

Answer (c) [2]

(d) A clinic, *C*, is 10 km from Airbase I on a bearing of 240° .

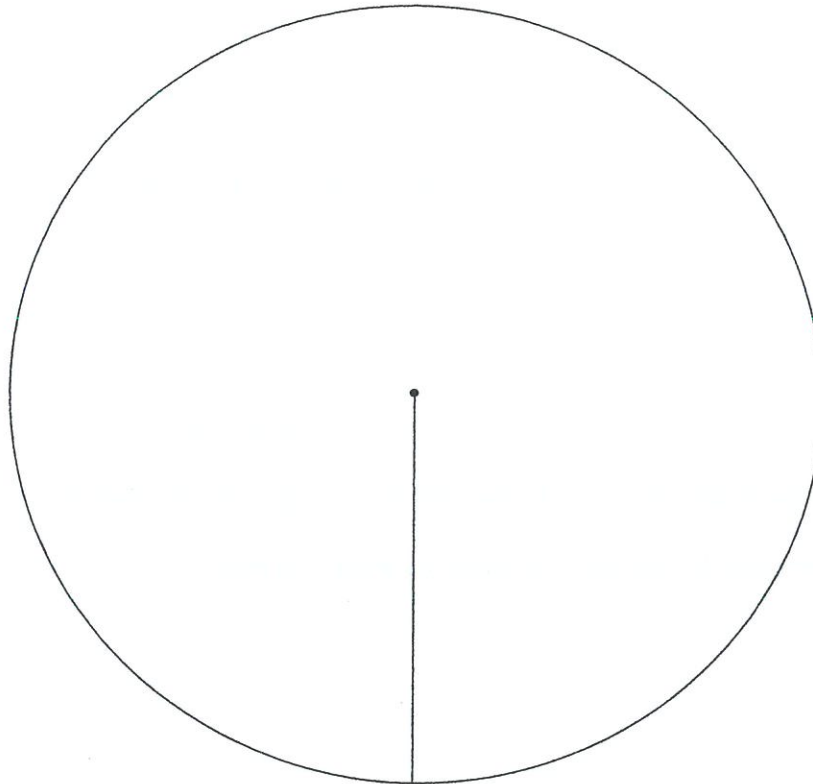
Mark and label with *C* the position of the clinic on the diagram. [2]

- 11 Two football teams, Moea and Linkoe, participated in a tournament.

The table shows the results of 30 games played by Moea in the tournament.

Result	Win	Draw	Loss
Frequency	12		8

- (a) Complete the frequency table. [1]
- (b) Draw and label a pie-chart to represent the information in the table.

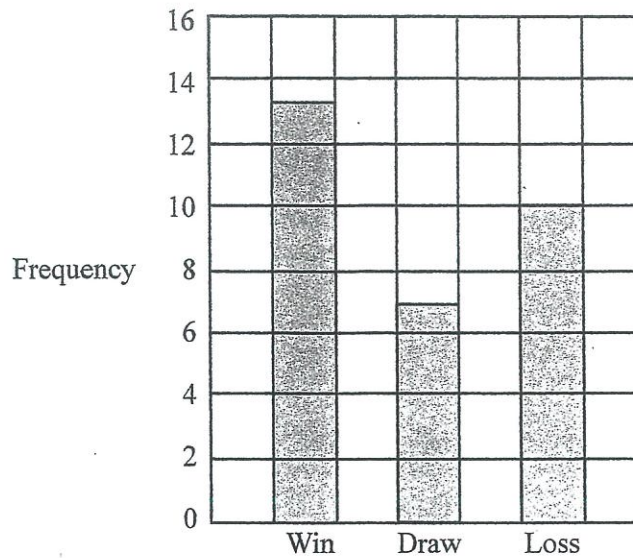


- (c) What is the mode of the result for Moea? [3]

Answer (c) [1]



- (d) The results for Linkoe are represented in the bar chart.



In the tournament, a team is awarded 3 points for a win, 1 point for a draw and 0 points for a loss.

Which of Moea or Linkoe finished with more points?

Show the working to support your answer.

Answer (d) [3]

- (e) Sebolelo watched only one of the games played by Linkoe.

Find the probability that it was a game in which the result was

- (i) a draw,

Answer (e)(i) [2]

- (ii) a win or loss.

Answer (e)(ii) [2]



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