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[illegible]

0178/03

May/June 2019

2 hours

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

Write your Centre number, candidate number and name on all the work you hand in.
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.

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.

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



- 1 The table shows part of a timetable for a bus from Matata to Liphakoeng.

Bus stop	Departure
Matata	08 00
Makaung	08 40
Ha Khantsi	09 00
Linkoeng	09 30
Liphofung	09 40
Linotsing	10 10
Liphakoeng	

- (a) State the time at which the bus departs Linkoeng.

Answer (a) [1]

- (b) The bus arrives at Liphakoeng bus stop at 10 45.

How long, in hours and minutes, does the bus take to travel from Matata to Liphakoeng?

Answer (b) h min [2]

- (c) Nthati arrives at Linotsing bus stop at 09 53.

Find how many minutes she waits before the 10 10 bus departs.

Answer (c) min [1]

- (d) Tšepo buys a monthly bus ticket at a reduction of $\frac{1}{3}$ off the normal price.

The normal price for this ticket is M189.

Find the amount Tšepo pays for his ticket.

Answer (d) M [2]

- (e) The bus travels from Ha Khantsi to Linkoeng at an average speed of 80 km/h.

Calculate the distance between Ha Khantsi and Linkoeng.

Answer (e) km [3]



- 2 (a) Lineo has M4 580.

She gives 45% of the money to her mother, and 20% of the money to her sister and keeps the rest.

- (i) Find the ratio

Lineo's share : Her sister's share.

Answer (a)(i) : [2]

- (ii) Find the amount her mother receives.

Answer (a)(ii) M [2]

- (b) Lefa visits a friend in America.

He converts M40000 into US dollars(\$) when the exchange rate is \$1 = M13.50.

- (i) Work out the amount he receives.

Answer (b)(i) \$ [2]

- (ii) While in America, he buys a camera for \$45.

In Lesotho, the same camera costs M650.

Work out the difference in cost of the camera between America and Lesotho, giving your answer in Maloti.

Answer (b)(ii) M [2]



(c) Tšepo buys a watch for M180.

(i) He sells the watch to Bulane at a 20% profit.

Find the price Bulane paid for the watch.

Answer (c)(i) M [2]

(ii) Bulane then sells the watch to Pule at a profit of 18%.

Who makes more profit, Tšepo or Bulane, and by how much?

Answer (c)(ii) by M [3]

(d) Tau takes a M4 000 loan at 10% compound interest per year.

Teboho takes a M6 000 loan at 8% simple interest per year.

Each loan is repaid using a single payment made at end of a two year term.

Find the total interest payment made on the two loans.

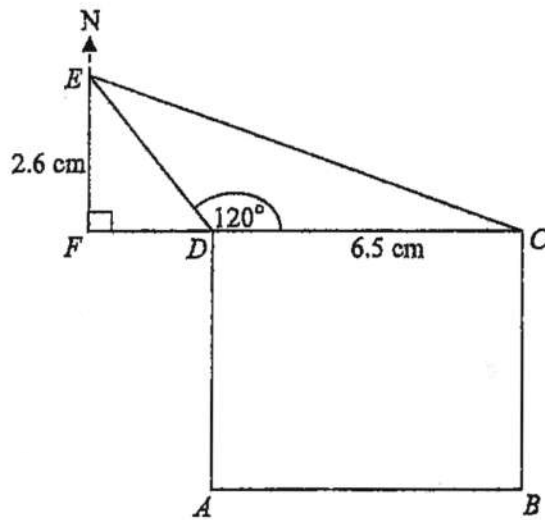
Answer (d)M [5]



- 3 In the diagram, $ABCD$ is a square, and CEF is a triangle.

D is a point on the horizontal CF .

$EF = 2.6$ cm, $DC = 6.5$ cm, $\angle FED = 90^\circ$, and $\angle EDC = 120^\circ$.



- (a) Find the bearing of D from E .

Answer (a)° [2]

- (b) Calculate

(i) DF ,

Answer (b)(i) cm [2]

(ii) EC .

Answer (b)(ii) cm [3]



(c) Find

(i) the area of triangle CDE ,

Answer (c)(i) cm^2 [2]

(ii) the shortest distance from D to CE .

Answer (c)(ii) cm [2]

(d) Another point G , on the diagram is such that quadrilateral $EDCG$ has exactly one line of symmetry which is EC .

(i) Sketch the shape $EDCG$ on the diagram.

[2]

(ii) What is the special name of the shape $EDCG$.

Answer (d)(ii) cm [1]

(iii) Describe fully the **single** transformation that maps EDC onto EGC .

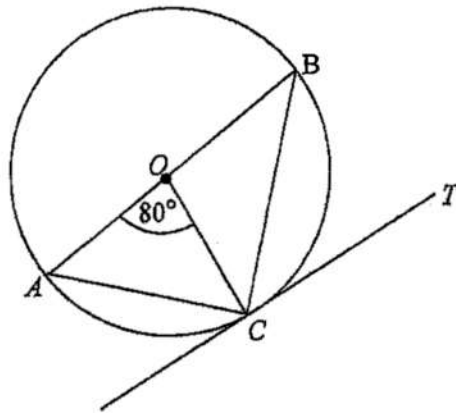
Answer (d)(iii)

[2]

- 4 (a) The diagram shows a circle with centre O .

AB is a diameter and CT is a tangent.

Angle $AOC = 80^\circ$.



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Calculate

- (i) angle OAC ,

Answer (a)(i) angle $OAC = \dots\dots\dots$ [2]

- (ii) angle OCB ,

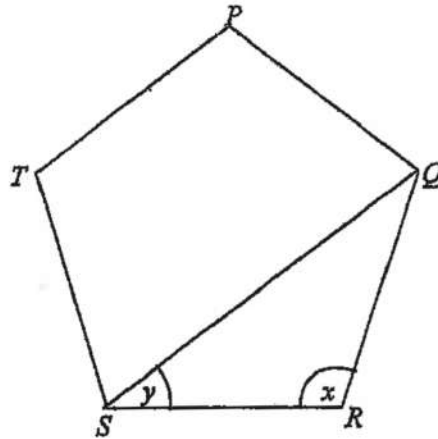
Answer (a)(ii) angle $OCB = \dots\dots\dots$ [2]

- (iii) angle BCT .

Answer (a)(iii) angle $BCT = \dots\dots\dots$ [2]



- (b) The diagram shows a regular pentagon $PQRST$.



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SCALE

- (i) Calculate x

Answer (b)(i) $x = \dots\dots\dots$ [2]

- (ii) Calculate y

Answer (b)(ii) $y = \dots\dots\dots$ [2]

- (iii) Give a reason why TP is parallel to SQ .

Answer (b)(iii) $\dots\dots\dots$
 $\dots\dots\dots$ [2]

- 5 (a) Express as a single fraction in its simplest form.

$$\frac{x+4}{3} - \frac{2x+5}{2}$$

Answer (a) [3]

- (b) Solve the following.

(i) $4x - 3 = -2$

Answer (b)(i) $x =$ [2]

(ii) $3(x - 2) - 2(2x - 1) = -9$

Answer (b)(ii) $x =$ [3]

(iii) $x^2 + x = 20$

Answer (b)(iii) $x =$, $x =$ [3]

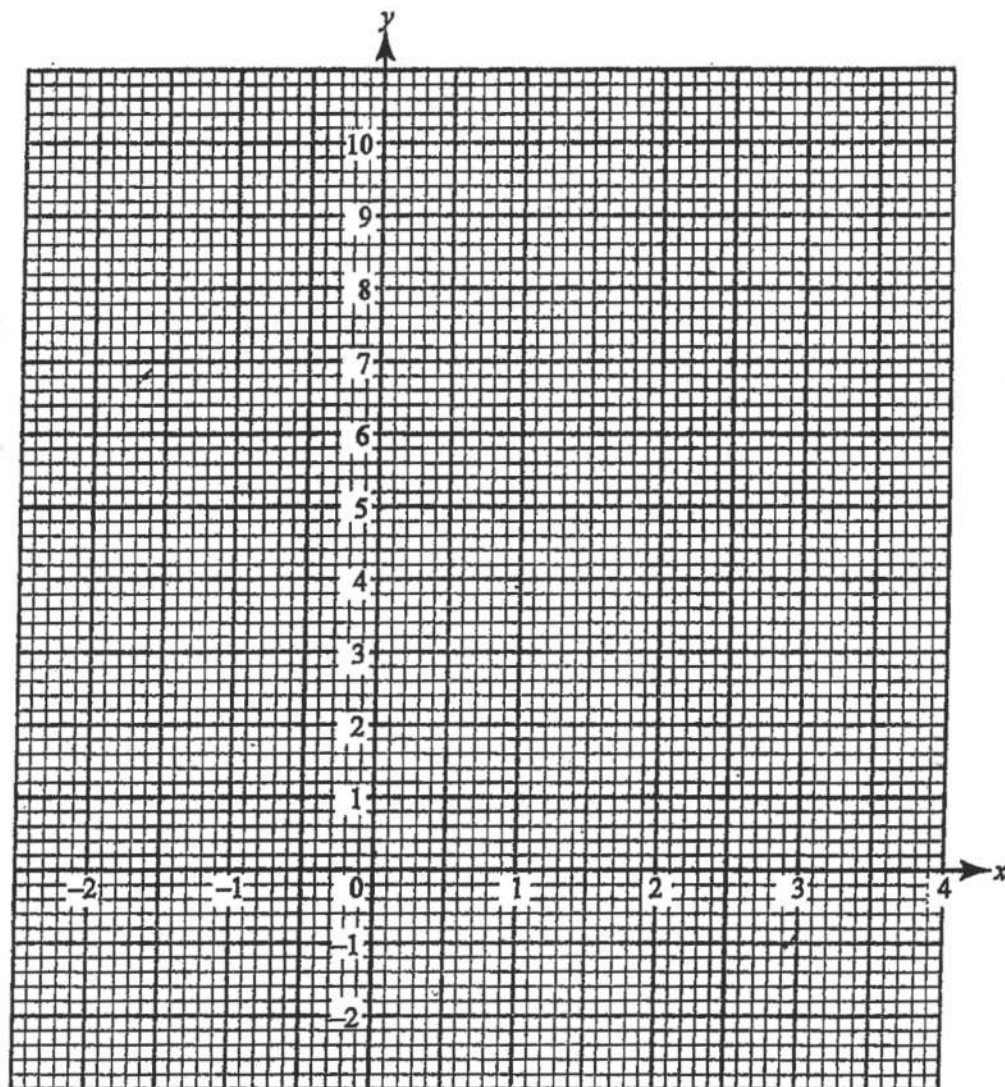


- 6 (a) Complete the table of values for $y = x^2 - 2x + 1$.

x	-2	-1	0	1	2	3	4
y	9		1	0		4	9

[2]

- (b) On the grid, draw the graph of $y = x^2 - 2x + 1$ for the values of x from -2 to 4.



[3]

- (c) Write the equation of the line of symmetry of the graph.

Answer (c) [1]

- (d) On the same axes, draw the line $y = 2$.

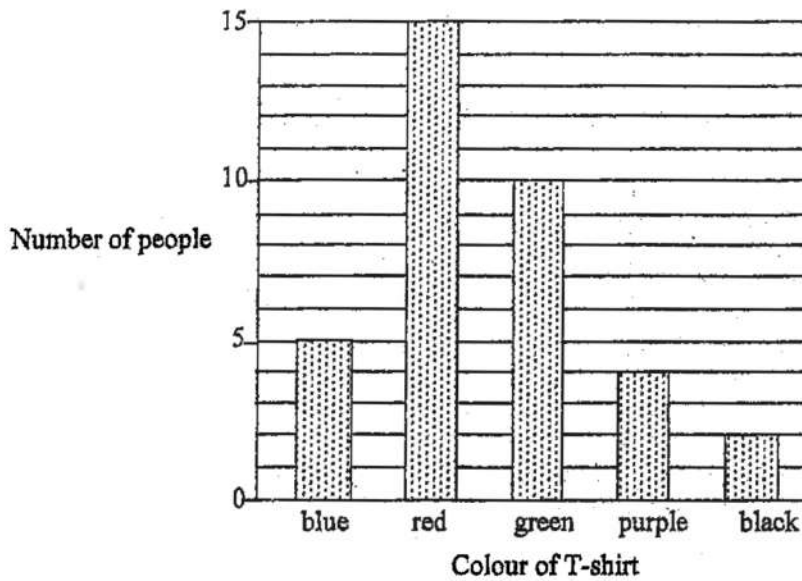
[1]

- (e) Write the values of x at which $y = x^2 - 2x + 1$ intersects $y = 2$.

Answer (e) $x = \dots\dots\dots$, $x = \dots\dots\dots$ [2]

- 7 (a) Lerato records the colours of T-shirts worn by all the people at a gym one day.

The graph shows his results.



- (i) Write the colour of the T-shirt that was worn least that day.

Answer (a)(i) [1]

- (ii) Find the number of people at the gym that day.

Answer (a)(ii) [2]

- (iii) Lerato represents the data using a pie chart.

Find the sector angle for those wearing purple T-shirts.

Answer (a)(iii) [2]



(iv) A person is selected at random from those at the gym that same day.

Find the probability that this person is wearing

(a) a red T-shirt,

Answer (a)(iv)(a) [1]

(b) either a blue or a black T-shirt.

Answer (a)(iv)(b) [2]

(b) The table shows types of seeds preferred by students in a class.

Type of seed	A	B	C	D	E
Number of students	15	11	5	3	8

(i) State the modal type of seed.

Answer (b)(i) [1]

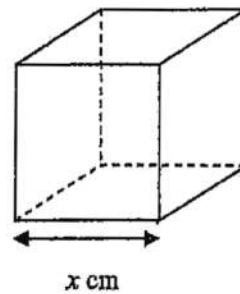
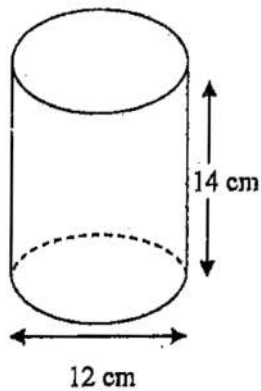
(ii) Explain why it is not possible to get a median type of seed.

Answer (b)(ii)
 [1]

- 8 The diagram shows a cylinder and a cube.

The cylinder has a diameter of 12 cm and a height of 14 cm.

The cube has a side of x cm.



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- (a) State

- (i) the number of vertices of the cube,

Answer (a)(i) [1]

- (ii) the radius of the cylinder

Answer (a)(ii) cm [1]

- (b) Calculate the area of the curved surface of the cylinder.

Answer (b) cm^2 [2]



(c) The cylinder and the cube have the same volume.

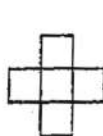
(i) Find the volume of the cylinder.

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

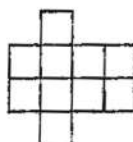
(ii) Find the value of x .

Answer (c)(ii) $x =$ [2]

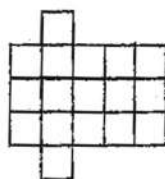
- 9 The diagram shows patterns of squares.



Pattern 1



Pattern 2



Pattern 3

Pattern 4

- (a) Draw the 4th pattern.

[1]

- (b) Find the number of squares in the 5th pattern.

Answer (b) [1]

- (c) Form an expression, in terms of n , for the number of squares in the n^{th} pattern.

Answer (c) [3]

- (d) Find the number of squares in the 24th pattern.

Answer (d) [2]

