QUESTION 1

1.1 Lindiwe is interested in early childhood education. She researched the number of learners enrolled in early childhood education in selected countries.

TABLE 1 shows the number of learners that were enrolled in early childhood education in selected countries.

TABLE 1: NUMBER OF LEARNERS ENROLLED IN EARLY CHILDHOOD EDUCATION BY COUNTRY FROM 2014 TO 2016

COUNTRY	2014	2015	2016
Bulgaria	240 622	241 123	232 025
Denmark	300 278	291 683	284 655
Germany	2 970 436	3 014 046	3 090 459
Ireland	78 056	71 096	82 245
Greece	231 155	225 596	214 109
Cyprus	N	29 669	30 505
Slovenia	83 700	84 750	85 407
Serbia	189 304	192 005	199 790
Turkey	1 064 190	1 158 826	1 221 165
Slovakia	158 195	161 906	163 740
United Kingdom	1 596 803	2 035 420	2 248 162
	-	-	-

[Adapted from appso.eurostat.ec/Europa.eu]

Use TABLE 1 to answer the questions that follow.

1.1.1 Determine the difference in the number of learners enrolled in Slovakia in 2015 and 2016. (3)

1.1.2 The range of the number of learners enrolled for 2014 is 2 947 664.

Calculate the value of N which represents the lowest number of learners enrolled for 2014. (3)

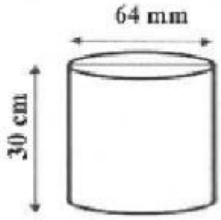
1.1.3 Describe the trend shown by the number of learners enrolled in Greece. (2)

1.1.4 Determine whether Turkey or the United Kingdom had the largest percentage increase from 2014 to 2016 regarding the number of learners enrolled in early childhood education. Show ALL your calculations. (6)

1.1.5 Determine (as a decimal fraction) the probability of randomly selecting a country in this table which shows a decline in enrolment from 2015 to 2016. (3)

LIVEWORKSHEETS

1.2 Lindiwe bought two bags of dirty marbles from her neighbour at R30,00 per bag. Each bag contained 100 marbles. She intends to wash the marbles before selling them to her friends at school. She uses a cylindrical container to wash the marbles in, as shown in the diagram below.

DIAGRAM OF A CYLINDRICAL CONTAINER	BAG OF MARBLES
 (Not drawn to scale)	
Inner diameter = 64 mm **Inner height = 30 cm**	**Volume of a single marble = 2 cm^3**

You may use the following formulae:

Volume of a cylinder = 3,142 × radius^2 × height

Circumference of a circle = 3,142 × diameter

NOTE: 1 000 cm^3 = 1 litre

Use the above information to answer the questions that follow.

1.2.1 Lindiwe made a profit of 120% from selling one bag of marbles.

Calculate, in rand, the selling price of EACH marble. (4)

1.2.2 To wash the marbles, Lindiwe placed all the marbles from both bags into the cylindrical container. She then filled the container with water.

Lindiwe stated that more than half a litre of water was required to fill the cylindrical container with the marbles already inside it.

Verify, showing ALL calculations, whether the statement is valid. (9)

LIVEWORKSHEETS

1.2.3 Calculate, in cm, the outer circumference of the cylindrical container used to wash the marbles if the container is made of metal 0,5 mm thick. (3)

[39]

QUESTION 2

2.1 After an examination, a total of 2 808 Mathematical Literacy scripts were marked at a particular marking centre.

TABLE 2 in ANNEXURE A shows data about the marking team, hours worked, tariffs and the amounts claimed for the marking and moderation of these scripts.

The marking process was planned as follows:

- The first day of marking was a Monday, starting at 14:00.
- Thereafter marking started at 08:00 and ended at 20:00 on a full marking day.
- Paid working hours excluded tea, lunch and supper breaks.

The marking team was paid a travel allowance of R3,26 per km for a total of 11 542 km travelled.

TABLE 3 below shows the times for actual marking and breaks for a full day.

TABLE 3: TIMES FOR ACTUAL MARKING AND BREAKS

START	TEA 1	LUNCH	TEA 2	SUPPER	FINISH
8:00	10:00–10:15	13:15–14:00	15:15–15:30	17:45–18:30	20:00

Use the above information and ANNEXURE A to answer the questions that follow.

ANNEXURE A

QUESTION 2.1

TABLE 2: MARKING TEAM, HOURS WORKED, TARIFFS AND AMOUNT CLAIMED FOR MARKING AND MODERATION

	NUMBER OF PERSONS	HOURS WORKED PER PERSON	TARIFF (R/hr)	AMOUNT (R) CLAIMED PER PERSON
Chief moderator (CM)	1	79	244,35	...
Internal moderator (IM)	1	79	244,35	...
Senior moderator	5	A	211,75	13 763,75
Markers	23	52	195,50	10 166,00
TOTAL	**30**	-	...	...

2.1.1 Determine the total amount claimed by the chief moderator (CM) and the internal moderator (IM). (3)

LIVEWORKSHEETS

2.1.2 Calculate the value of **A** in TABLE 2. (2)

2.1.3 Markers are allowed a maximum number of marking hours based on the following formula:

$$\textbf{Number of marking hours} = \frac{\textbf{Total number of scripts} \times \textbf{28}}{\textbf{Number of markers} \times \textbf{60}}$$

(a) Using the above formula, determine the expected time and the day on which the markers are likely to finish marking. (6)

(b) Determine the actual day and time when markers finished, according to the hours claimed, if marking started at 14:00 on Monday. (4)

(c) Give ONE possible reason why the markers finished before the expected time. (2)

LIVEWORKSHEETS

2.2 The IM and CM were allocated tables with semicircular-shaped table tops, as shown in the picture below. Lumka, the centre manager, explained that two semicircular table tops are made from one square piece of wood.

TABLE WITH A SEMICIRCULAR TOP

The information on how the semicircular tops are cut from the square piece of wood is in ANNEXURE B. The dimensions of the wood are 2,7 m × 2,7 m with a thickness of 38 mm.

You may use the following formulae:

Area of a square = side × side

Area of a semicircle = $\dfrac{3{,}142 \times \text{radius}^2}{2}$

Volume of a rectangular prism = length × width × height

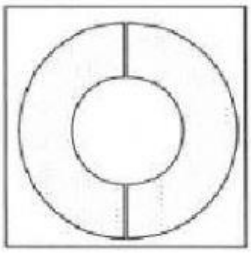
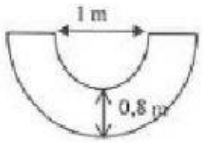
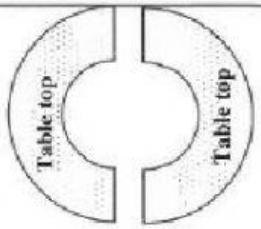
Use the information above and ANNEXURE B to answer the questions that follow.

LIVEWORKSHEETS

ANNEXURE B

QUESTION 2.2

TABLE WITH A SEMICIRCULAR TOP

SQUARE BOARD WITH SIDE 2,7 m	TWO SEMICIRCULAR-SHAPED TOPS CUT FROM A SQUARE BOARD	DIMENSIONS OF THE TABLE TOP (NOT DRAWN TO SCALE)
2,7m × 2,7 m with a thickness of 38 mm		
		

2.2.1 Lumka stated that 2,01 m^2 of the wood is cut off when making two semicircular-shaped table tops from one piece of wood.

Verify, showing calculations, whether Lumka's statement is valid. (8)

2.2.2 The wood used is sold for R1 215 per cubic metre, excluding VAT at 15%.

Calculate the total cost, including VAT, of the wood to make 12 semi-circular table tops. (7)

[38]

LIVEWORKSHEETS