



MATHEMATICAL LITERACY: PAPER II

EXAMINATION NUMBER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of:
 - 24 pages
 - 4 questions
2. Please check that your question paper is complete.
3. Answer ALL the questions.
4. Answer on this question paper.
5. It is strongly suggested that all working details be shown.
6. Approved non-programmable calculators may be used in all questions.
7. It is in your own interest to write legibly and to present your work neatly.
8. Maps and diagrams are not necessarily drawn to scale, unless stated otherwise.

QUESTION	1	2	3	4	TOTAL
MARK					
TOTAL	35	61	33	21	150

QUESTION 1

1.1 The Kaizer Chiefs football team calls the Moses Mabhida Stadium in Durban their "home base". This means that they do all their practices and home games at this stadium.

This beautiful stadium is crowned by an arch that is 106 metres above the ground at its highest point. Tourists can walk or use the "sky car" to get to the top of the arch.



[Source: <<https://www.mmstadium.com>>]

1.1.1 Wikipedia states that the construction costs for this stadium were 3,4 billion South African rand (ZAR) in 2006, which was approximately 450 million American dollars (USD). Determine what the exchange rate was in 2006 and write your answer in the format 1 ZAR = ... USD.

(4)

1.1.2 An American family of 5 decides to go up in the sky car. The family consists of 2 parents, 2 children, ages 11 and 14, and one grandparent, age 73.

The tariffs for the sky car are as follows:

Adults: R60 per person

Pensioners (adults 60 years and over): R55 per person

Children under 12: R30 per person

Children under 6: Free entry

Learners on school tour: R30 per person

Calculate what it would cost this family to all go up in the sky car.

(4)

1.1.3 The current exchange rate is 1 ZAR = 0,08 USD. Determine what the family would be paying for the tickets in USD.

(3)

1.1.4 Use the exchange rate you calculated in Question 1.1.1 to determine the percentage change in the exchange rate between 2006 and 2018.

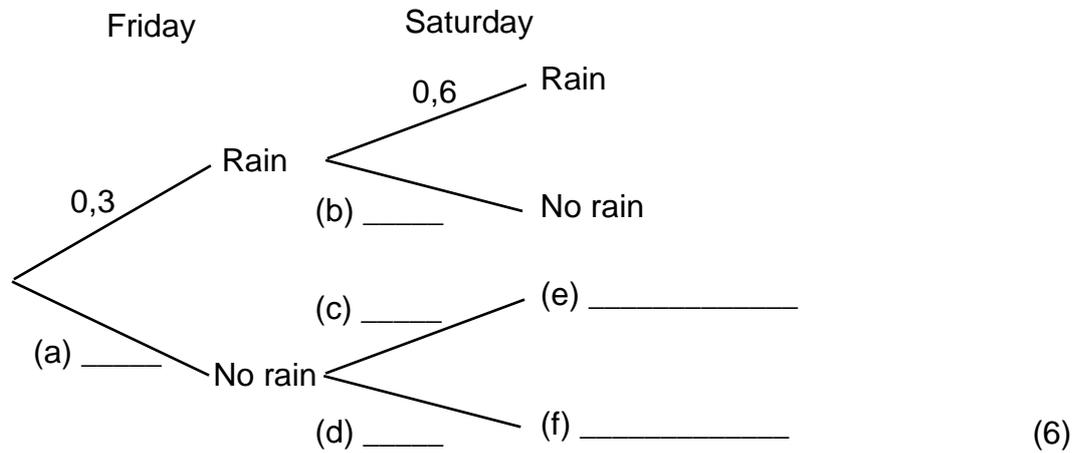
(4)

1.2 The capacity of the stadium when it is full is 85 000 people and an average ticket to a Kaizer Chiefs game costs R90. If they only managed to sell three quarters of the tickets, calculate the amount of money the stadium loses out on.

(4)

1.3 Kaizer Chiefs has a match on Saturday. The weather forecaster predicts that there is a 30% chance of rain on Friday. If it rains on Friday the chance that it will rain on Saturday is 60%. If it does not rain on Friday the chance that it will rain on Saturday is 20%.

1.3.1 Complete the tree diagram below by using the information above. Give your answer correct to one decimal place where necessary:



1.3.2 Determine what the probability will be, as a percentage, that it will not rain on Friday or Saturday.

(4)

QUESTION 2

In the fishing industry, and especially for recreational fishing (fishing for fun), there are some species of fish that have limitations on the size and the number of fish that one may catch per day.

The limit in terms of the number of fish that one person may catch daily is called the bag limit.

Below is a table of some of the species of fish with their minimum sizes and bag limits. Use this information to answer the questions that follow:



Species of fish Common name	Min. size	Bag limits
Anchovies	None	None
Bronze bream (bluefish)	30 cm	2
Cape knifejaw	None	5
Galjoen	35 cm	2
Hottentot	22 cm	10
Pinky (piggy)	7,5 cm	10
Scotsman	40 cm	1



[Source: <<http://www.daff.gov.za/>>]

2.1 If a fisherman does not know the bag limits, which fish would be the safest for him to catch and why?

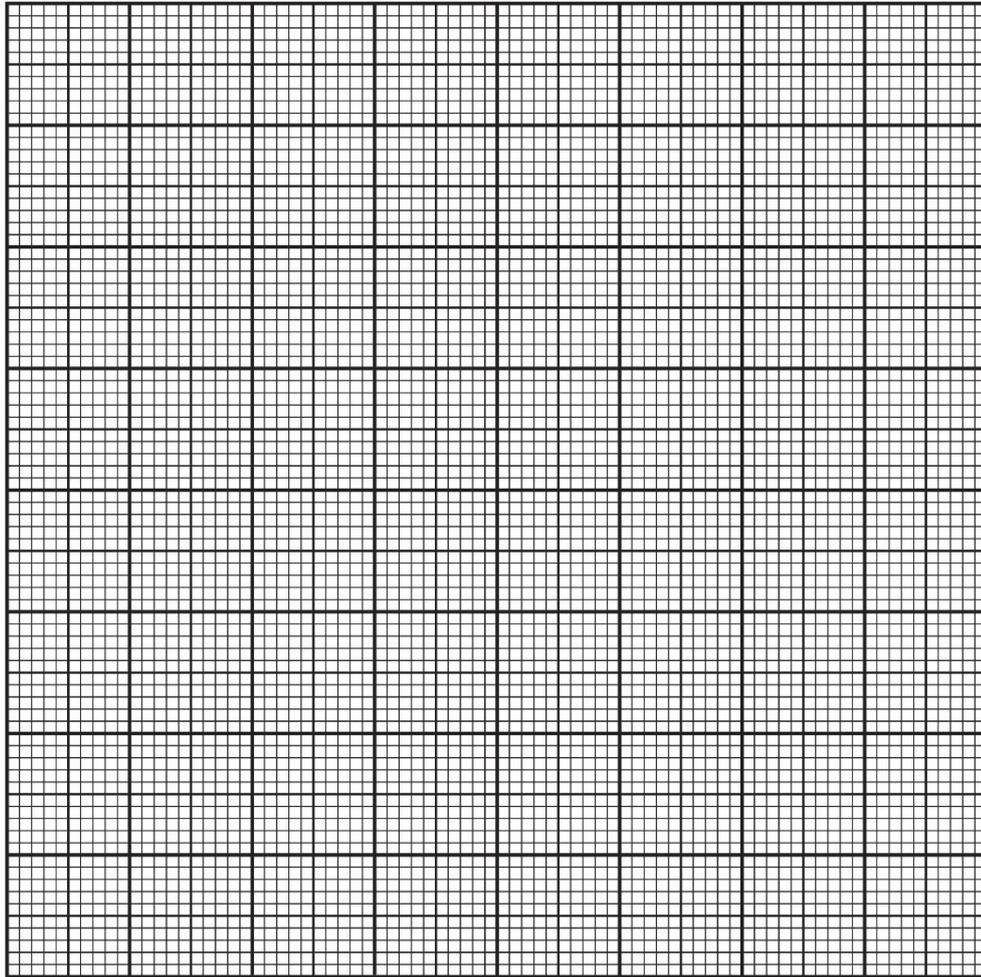
(2)

2.2 The KwaZulu-Natal Parks Board is responsible for ensuring that these limitations on the specific species are adhered to. The Parks Board does this by issuing fines to fishermen who do not abide by these rules. The fine is R500 for the first fish caught that exceeds the bag limit and a further R250 for every fish thereafter.

2.2.1 Write down an equation that will represent the relationship between the number of fish caught over the limit and the cost of the fine. Let **C** be the total cost of the fine and **n** the number of fish caught over the bag limit.

(5)

2.2.2 On the graph paper below draw the graph that represents the cost of fines for the **galjoen** fish if a maximum of 10 fish are caught.



(8)

2.2.3 Use your graph to determine the amount a fisherman would be fined if he caught 7 galjoen.

(2)

2.2.4 The fisherman needs to get money to pay his fines. If he sells the 7 fish he caught for R240 each, will he have enough money to pay his fines? Justify your answer with calculations.

(3)

THIS PAGE HAS DELIBERATELY BEEN LEFT BLANK

2.3

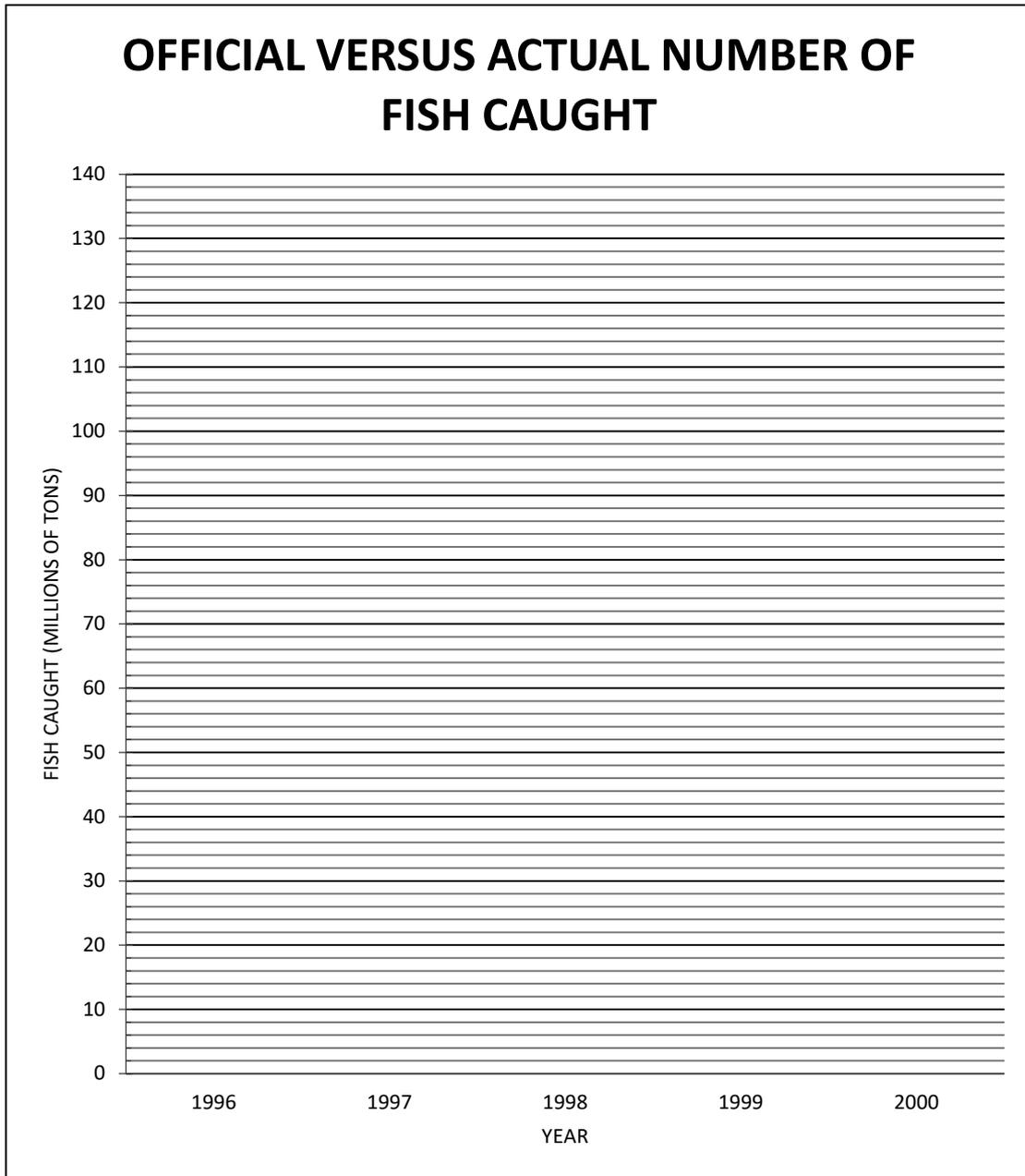
In a paper published in *Nature Communications*, researchers found that while the quantity of fish caught annually reached its peak in 1996, that peak was much higher than originally thought. Instead of pulling out 86 million tons of fish that year, we actually took 130 million tons of fish out of the oceans. Since then, those numbers have gone down.

Officially, the quantity of fish caught globally has declined by 1.2 million tons each year since the 1996 peak, but the paper's authors found that actually, we've only been reducing that massive number by 0.38 million tons per year.

[Source: <www.popsci.com>]

2.3.1 Use the figures given to complete the table and then plot a compound bar graph showing the difference between the official quantity of fish caught and the actual quantity of fish caught.

QUANTITY OF FISH CAUGHT ANNUALLY (TONNES)		
YEAR	OFFICIAL	ACTUAL
1996	86 000 000	130 000 000
1997		
1998		
1999		
2000		



(11)

2.3.2 The U.N. Food and Agriculture Organisation (FAO) reported the following number of fish caught.

Year	Number of fish caught in millions of tons
2000	95
2001	91
2002	91
2003	87
2004	93
2005	93
2006	90
2007	90
2008	90
2009	89
2010	90

Use the information in the table to calculate the following:

(a) The range of fish caught

(2)

(b) The median amount of fish caught

(2)

(c) The modal amount of fish caught

(2)

(d) The mean amount of fish caught

(3)

2.4 A fisherman from Durban decides he wants to go to Richard's Bay to try the fishing there.



2.4.1 Convert the bar scale on the map to a ratio scale in unit form, i.e. 1 :

(4)

2.4.2 Next, determine the approximate distance between Durban and Richard's Bay, which lies NE of Durban.

(3)

2.4.3 Refer to the distance table below when answering the following questions:

Durban				
236	Ladysmith			
170	336	Richard's Bay		
356	422	195	Sodwana Bay	
134	366	303	492	Margate

(a) Calculate the difference between the distance calculated in Question 2.4.2 and the distance given in the table.

(3)

(b) Which do you think is the most accurate, the distance calculated using the bar scale or the distance given in the table? Give a reason for your answer.

(2)

- (c) The fisherman travelling from Durban to Richard's Bay only has a quarter of a tank of petrol. The fuel consumption of his car is 12 km/litre and his car has a 50 litre tank. Use the distance table to determine if he has enough petrol to make it to Richard's Bay.

(4)

- (d) If he is travelling at an average speed of 80 km/h, determine how long it will take him to get to Richard's Bay. Write your answer in hours and minutes.

(5)
[61]

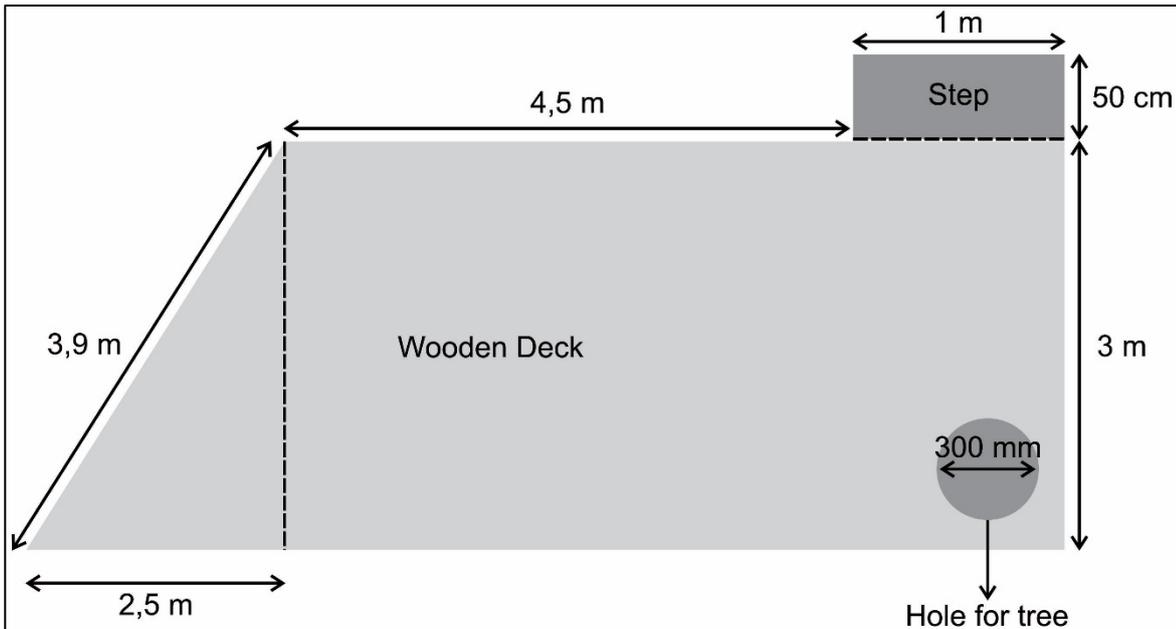
QUESTION 3

Levi has decided to build a wooden deck in his garden. The wooden deck will have a step to make it easier to get onto the deck. There is a tree in one of the corners of the deck which Levi wants to keep so he will have to cut a circular hole out of the deck to accommodate it.



Strips of wood that the deck is made of

The deck has the shape below:



3.2 The circular hole Levi wants to cut out of the deck has a diameter of 300 mm. The circumference of the tree is 0,99 m. Determine with the use of calculations whether the hole will be big enough to accommodate the tree.

You may use the following formula:

$$\text{Circumference} = \pi \times \text{diameter}$$

OR

$$\text{Circumference} = 2 \times \pi \times \text{radius}$$

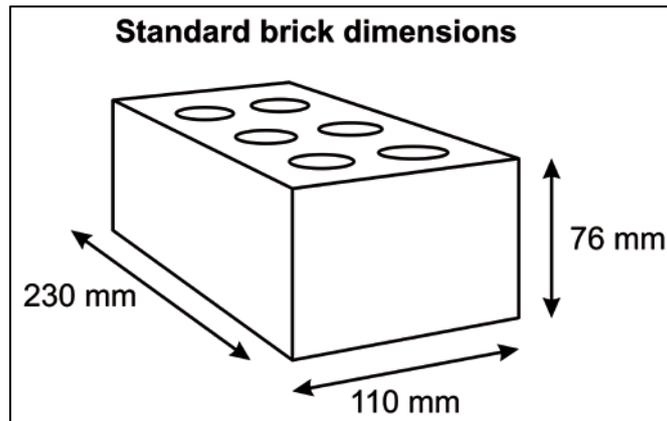
$$\text{use } \pi = 3,14$$

(4)

3.3 The wood for the deck that Levi wants to use is sold in strips of 15 cm x 1,2 m. Levi wants to play it safe and buy enough wood for 21 m². Determine the minimum number of strips he will have to buy.

(5)

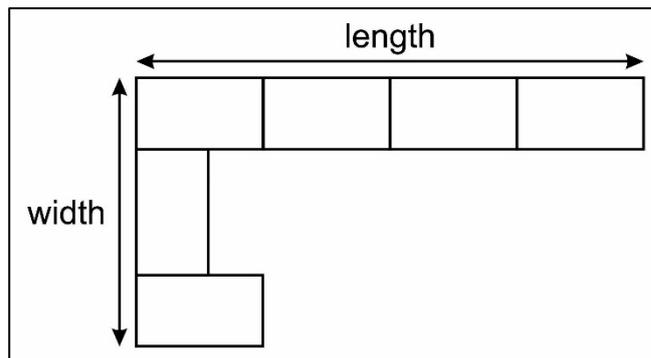
3.6 Levi wants to build the step out of bricks. The dimensions of the bricks he will use are given below.



The step should have the following approximate dimensions:

length = 1 m, width = 50 cm, height = 15 cm.

The diagram below represents the layout of the bricks for the step, as seen from above.



Determine the minimum number of bricks Levi will have to buy to build the step.

(8)
[33]

QUESTION 4



The South African Mint produces, besides the country's currency, collectible gold coins, called Krugerrands. There are four coins of different sizes, according to weight, in the Classic Gold Proof Collection. Below are the coins with their weight, diameter and cost.



1 OZ FINE GOLD	1/2 OZ FINE GOLD	1/4 OZ FINE GOLD	1/10 OZ FINE GOLD
32 mm	27 mm	22 mm	16,5 mm
R31 600	R14 500	R7 900	R3 800

[Source: <www.samint.co.za>]

4.1 Determine the weight of the one-tenth of an ounce (oz) Krugerrand in grams, given the following:

1 oz	= 0,0625 lbs
1 g	= 0,0022 lbs

(4)

4.2 Determine if the ratio of the weight to cost is the same for the one-tenth of an ounce (oz) coin and the 1 ounce Krugerrand.

(4)

4.3 Refilwe wants to buy a $\frac{1}{4}$ oz Krugerrand but does not have enough money now. She decides to deposit the money she has into a savings account with interest that is compounded annually, and leave it there for the next three years.

4.3.1 Refilwe calculates that this bank account will earn her R375 interest in the first year if she deposits R5 000. Determine the interest rate this bank is offering her. Give your answer as a percentage.

(3)

4.3.2 Refilwe finds another bank that offers her a better interest rate of 11,5%. Complete the table below:

(a)

Year	Amount at beginning of year	Interest gained	Amount at end of year
Year 1	R5 000	R575	R5 575
Year 2	R5 575	(i) R	(ii) R
Year 3	(iii) R	(iv) R	(v) R

(5)

- (b) Will Refilwe have saved enough money to buy her coin?
Justify your answer.

(2)

- 4.4 The cost of the 1 oz Krugerrand is R31 600 including VAT. If VAT is charged at 15%, determine what the cost of the coin is excluding VAT. Round your answer to the nearest cent.

(3)
[21]

Total: 150 marks