



Province of the
EASTERN CAPE
EDUCATION

MATHEMATICAL LITERACY P2

COMMON TEST

JUNE 2014

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MARKS: 100

TIME: 2 Hours

This question paper consists of 14 pages and 1 annexure.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **FIVE** questions. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Answer QUESTION 2.4.4 on ANNEXURE A. Write your name in the space provided and **hand in the ANNEXURE** with you ANSWERBOOK.
4. Start **EACH** question on a **NEW** page.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. **ALL** the calculations must be clearly shown.
7. **ALL** the final answers must be rounded off to **TWO** decimal places, unless stated otherwise.
8. Units of measurement must be indicated where applicable.
9. Write neatly and legibly.

QUESTION 1

1.1

The sports organizer of Mzila Comprehensive High School is worried about the shortage of female athletes. This is due to them being overweight. He calculated the **Body Mass Index (BMI)** to determine the weight status of female learners in his school. The table below shows the height, ages and weight of a sample of female learners he surveyed.

Table 1: The age, mass and height of surveyed female learners

Learner	Age(Years)	Height(m)	Mass(kg)	BMI
Learner 1	14	1.65	65kg	
Learner 2	18	1.7	72kg	A
Learner 3	16	1.62	68kg	23.6
Learner 4	16	1.5	65kg	B
Learner 5	18	1.55	72kg	
Learner 6	15	1.56	66kg	27.1
Learner 7	16	1.55	62kg	
Learner 8	17	1.58	63kg	25.2
Learner 9	15	C	69kg	27
Learner 10	16	1.55	53kg	22
Learner 11	17	1.66	81kg	
Learner 12	17	1.63	71kg	27,7

1.1 Calculate the BMI to determine the status of the following learners.

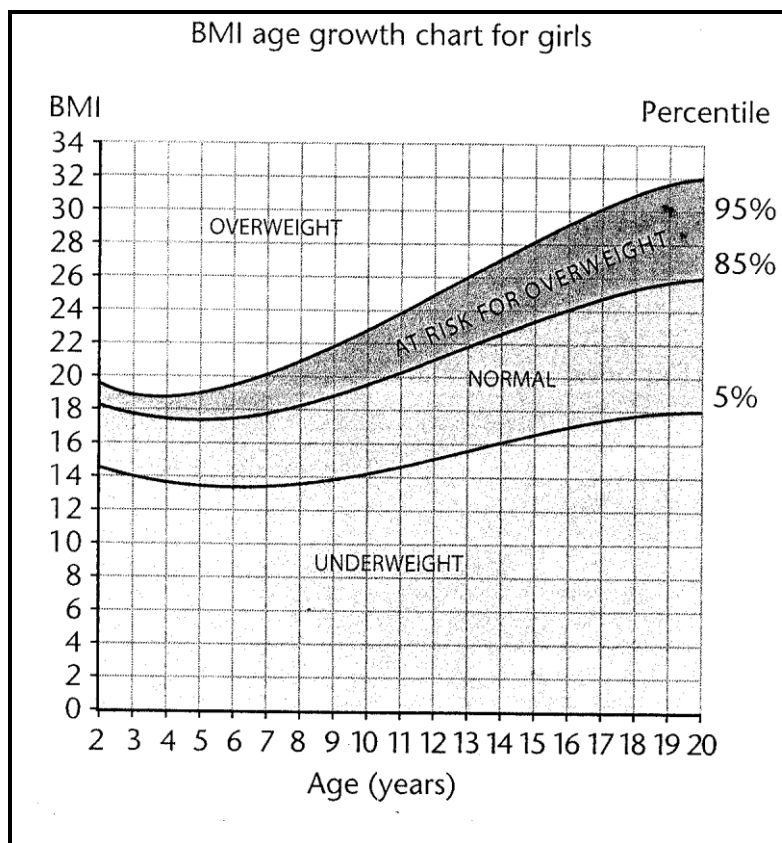
1.1.1 (a) Learner 2 (A) (2)

(b) Learner 4 (B) (2)

Use this formula:
$$\text{BMI} = \frac{\text{weight (kg)}}{\text{Height (m)}^2}$$

1.1.2 By using the above BMI formula, determine the height of Learner 9 if her BMI is 27. (3)

1.2 The BMI is used to determine the **weight status** of individuals. The sports organizer downloaded the following BMI age growth chart for girls to determine their weight status for this sample.



1.2.1 In which weight status category does learner 10 belong? (2)

1.2.2 Determine the BMI range for a normal weight status. (2)

1.2.3 Explain what is meant by: **a 14 year old learner is in 95th percentile?** (2)

1.2.4 Learner 6 is determined to move from being overweight to a normal weight. How much weight must she lose to achieve her aim. (3)

1.2.5 Suggest any two reasons (advice) to be given to overweight learners in order for them to lose weight or maintain normal weight. (4)

1.3 An athletic team was formed by Mzila Comprehensive High School. This team entered a 45km race from Pietermaritzburg to Drummond. The athletic coach analyzed running times of the **three** best athletes in the following table.

Table 2: Distance and time run by Mzila Comprehensive Athletes

Place on the route	Total Distance	Running Times between each point (Hours, Minutes, Seconds)		
		Athlete 1	Athlete 2	Athlete 3
Pietermaritzburg	0km	00:00:00	00:00:00	00:00:00
Lion Park	16km	01:49:12	01:59:39	01:48:15
Camperdown	26.9km	00:58:18	00:45:25	00:48:23
Cato Ridge	35km	01:25:19	01:18:57	01:28:05
Inchanga	40km	00:58:25	00:44:20	00:46:19
Finish Drummond	45km	01:29:58	00:43:08	00:45:58

1.3.1 Calculate the distance from Camperdown to Inchanga. (2)

1.3.2 **NOTE:** All three athletes started the race exactly at the same.

(a) If the race started at 06h00, at what time did athlete 1 reach Camperdown? (3)

(b) Athlete 3 reached the finishing point later and was convinced that he had arrived before athlete 2. This is because he had never seen him since Lion Park. Determine the time athlete 2 arrived at the finishing point to justify whether athlete 3 is correct. **NOTE: (athlete 2 passed Camperdown at 08:45:40)** (3)

[28]

QUESTION 2

2.1

KwaZulu-Natal coastline is the most popular tourist destination particularly during winter season. Its coast stretches from Port Edward (at south west) to Kosi Bay (at north east) and its total estimated length is 580km.



www.kwazulunatal.gov.za

- 2.1.1 The most densely populated part of coastline is from **Port Edward** to **Umhlali**. Estimate the length (in km) of this coastline if it is 40% of the total Kwazulu Natal Coast. (2)
- 2.1.2 The coastline is 210mm long on the map. Determine the scale of this map in the form of **1 :**
(NB: Round off the answer to the nearest hundred thousand) (4)
- 2.1.3 The length of the bar scale of this map is 45mm and the coastline has been found to be 210mm long on the map. Use the given **bar scale** and verify that the total length coastline is approximately 580km. (3)

- 2.2 By looking at this map, suggest any possible reason for relatively fewer people in north coast. (2)

2.3

Some visitors of Kwazulu-Natal coast come for the annual late autumn or early winter (around June) phenomenon on the KwaZulu-Natal coast of the "[sardine run](#)". They've swam for more than 30 days from their reproduction ground in the Cape to reach South Africa's east coast. Scores (many) of fishermen join the sharks, game fish, marine mammals and birds that gorge (feast) themselves on the shining band of silver fish. These sardines just disappear into deeper water around Durban.



www.kwazulunatal.gov.za

- 2.3.1 It is estimated that the sardine-run shoals (a group of fish) are 15km long. If one sardine has an average length of 20cm. Estimate the number of fish that will form this straight line (15 km) one behind the other. Assume that there is no space between them. (3)
- 2.3.2 The crate used by fishermen can load about 500 sardines. Approximately how many crates will be needed to load the number of sardines calculated in 2.3.1? (2)



- 2.4 The perfect warm weather is also a tourist attraction in Kwazulu-Natal coast. Study the following three-day weather forecast of Durban coast and Cape Town.

Weather Forecast for Durban Coast

	Fri morning	Fri afternoon	Fri night	Sat morning	Sat afternoon	Sat night	Sun morning	Sun afternoon
Summary	clear	clear	cloudy	clear	some clouds	rain showers	cloudy	rain showers
Chances of rain	-	-	-	-	30%	40%	30%	60%
Max. / Min Temp (C)	18/24	20/24	17/23	24/ 27	23/25	21/ 22	17/21	22/ 23
Sunrise	6:16	-	-	6:16	-	-	6:16	-
Sunset	-	17:32	-	-	17:31	-	-	17:30

	18 morning	18 afternoon	18 night	19 morning	19 afternoon	19 night	20 morning	20 afternoon
Summary	clear	clear	clear	some clouds	cloudy	clear	clear	clear
Chances of rain)	-	-	-	30%	-	-	-	-
Max. /Min Temp(C)	19/23	21/25	17/19	19/20	16/18	15/18	20/20	15/18
Sunrise	7:07	-	-	7:07	-	-	7:07	-
Sunset	-	18:24	-	-	18:23	-	-	-

Weather Forecast for Cape Town Coast

<http://www.weather-forecast.com/locations/Cape-Town/forecasts/latest>

- 2.4.1 Looking at Durban coast's **maximum** temperatures given in this weather forecast, what is the probability that **maximum** temperature will be below 23° or 22° . Leave your answer in percentage form. (3)
- 2.4.2 Compare your answer in 2.4.1 with Cape Town's maximum temperature to justify the fact that Durban's weather is attractive during winter season. (2)

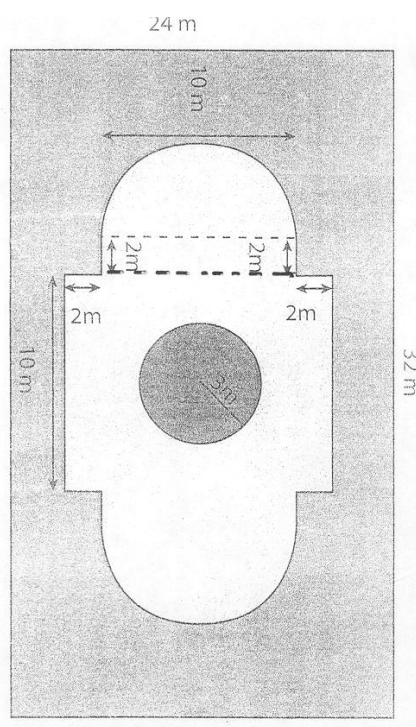
- 2.4.3 What is the probability that Durban will experience rain on a Sunday afternoon. (2)
- 2.4.4 Use Annexure A to draw a **fully labelled double bar** graph to compare the afternoon's minimum temperatures of Durban Coast and Cape Town during these three days. (5)
- 2.4.5 Using the given weather forecasts and the graph of these coasts, what would be the best day to go to the beach in Durban? Justify your answer. (3)

[31]

QUESTION 3

3.1

Most local municipalities in SA are erecting statues of the international icon, Mr Nelson Mandela. The following diagrams are in Mr Chetty's advertisement sent to all local municipalities in South Africa. The statue is erected at the centre of the pond. The pond is made of rectangular shape at the center and two semi circular shapes on the either side as shown below. The black circle (**has a diameter of 3.8m**) in the middle indicates where the statue will be erected. The area around the pond is paved by bricks.

Statue of Nelson Mandela**The Pond area For the Statue**

- 3.1.1 A protective fence must be erected around the pond. Determine the perimeter to be covered by the fence. (3)

These formulae may be used:

$$\text{Perimeter of rectangle} = 2(\ell + b)$$

- 3.1.2 Let the volume of the pool be $193,91\text{m}^3$. Calculate the new volume of the pool after the inner circle has been erected. Use π as 3.142 (4)

- 3.2 Currently, the quantity and cost of paint is as follows:

Quantity	Cost
5 litres	R320-00
10 litres	R580-00
20 litres	R950-00

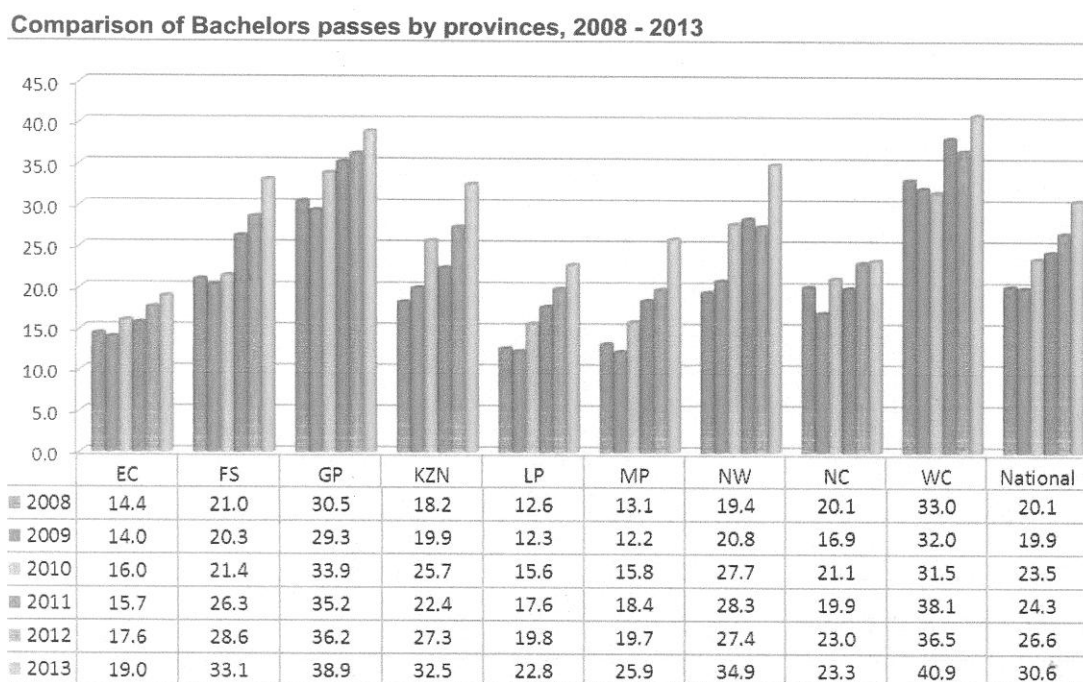
- 3.2.1 The total surface area of the pool is made up of all 3 rectangular shapes and a cylinder. Find the total surface area of the pool (excluding the floor) if the Surface Area (SA) of the **all rectangular walls in 27m^2** .
USE THIS FORMULA: Surface area of cylinder = πrh (4)
- 3.2.2 One litre of paint covers one coat of paint on 3m^2 of the wall. Determine the number of litres of paint to cover all the inside walls of the pond. (4)
- 3.2.3 Determine the tin size (tin of paint) that is the cheapest per litre. (4)
- 3.2.4 Provide an advice on the size of the tin that will be most economical. (3)

[22]

QUESTION 4

4.1

The following graph shows the comparison of Bachelor passes by provinces (2008 – 2013) presented by the Minister of Education during the release of 2013 Matric results.



Extracted from: Report on the 2013 National Senior Certificate Technical Report

- 4.1.1 Express the National Bachelor passes to Limpopo Province (LP) Bachelor passes in 2013 in its simplest ratio. (2)
- 4.1.2 Kwazulu-Natal Bachelor passes increased by 14.3% from 2008 to 2013. Compare the percentage increase of Kwazulu-Natal Province and that of National Bachelor passes in the same period. (2)
- 4.1.3 Kwazulu-Natal Province got 77.4% passes out of 145 278 candidates that wrote in 2013. 32.5% of passes got Bachelors. How many candidates got Bachelor passes. (5)
- 4.1.4 If the Minister wishes to give an award for producing more Bachelor passes, which province would you recommend? Justify your answer by referring to the graph. (3)

4.2

Mrs Zondi's daughter is doing Grade 10. She wishes to do Information, Communication and Technology (ICT) after passing Matric. But was shocked by the current registration fees of R17 050, yet during her time she paid R7 500 for registration. Inflation is blamed for this rise.

INFLATION: the continuous rise in prices which results in the reduction of the value of money.

4.2.1 If Mrs Zondi registered for the same ICT course in 2002, determine the average inflation rate from 2002 to 2013. Use formula $\frac{\text{New} - \text{old}}{\text{old}} \times 100$ (2)

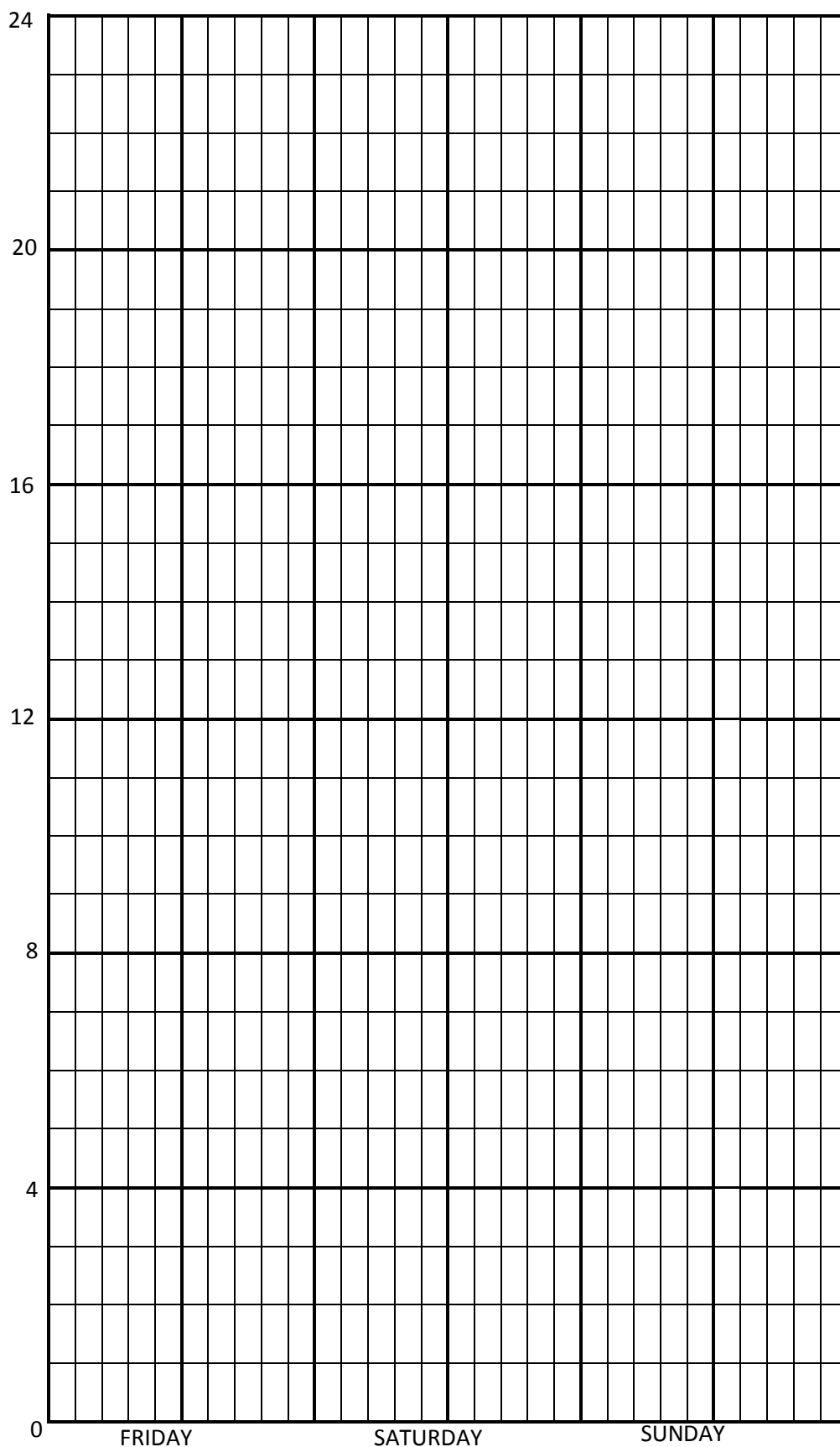
4.2.2 Having the knowledge of predicted inflation rates, Mrs Zondi decided to invest **R15 000 to an account which pays different simple interests rates as shown below.**

Year	2014	2015	2016	2017
Interest Rate	8.8%	9.8%	8.4%	10.8%
Balance	R16320	R16470	R16260	R16620
Inflation Rate	6.8%	7.2%	6.5%	7.7%
Value of R15 000	R15300	R15390	R15285	

Will the value of R15 000 be lower than R16 620 in 2017? Provide the possible reason for your answer and show your workings.

(5)
[19]

TOTAL MARKS: [100]

ANNEXURE A: QUESTION 2.4.4**NAME OF LEARNER** _____ **GRADE 12** _____

PLEASE TEAR ON TEAR DOTTED