

# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**MATHEMATICAL LITERACY P1**

**NOVEMBER 2016**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MARKS: 150**

**TIME: 3 hours**

**This question paper consists of 10 pages, 2 answer sheets and  
an addendum with 4 annexures (5 pages).**



**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. 2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions:  
  
ANNEXURE A for QUESTION 1.1  
ANNEXURE B for QUESTION 3.1  
ANNEXURE C for QUESTION 3.2  
ANNEXURE D for QUESTION 5
- 2.2 Answer QUESTION 1.2.4(a) on the attached ANSWER SHEET 1.  
Answer QUESTION 4.2.6 on the attached ANSWER SHEET 2.
- 2.3 Write your centre number and examination number in the spaces on the ANSWER SHEETS. Hand in the ANSWER SHEETS with your ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations clearly.
7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.



## QUESTION 1

1.1

ANNEXURE A shows a home loan statement and transaction history for the period 22 September 2013 to 22 March 2014.

## NOTE:

- The period of the home loan is 20 years.
- The monthly administration fee remains constant throughout the period of the loan.
- The interest rate changed only once during this statement period.

Use ANNEXURE A to answer the questions that follow.

- 1.1.1 Give the name of the borrower. (2)
- 1.1.2 State the end date (month and year) of the loan. (2)
- 1.1.3 Calculate the difference between the insured value of the property and the registered bond amount. (2)
- 1.1.4 Determine the total administration fee payable for the whole loan period. (3)
- 1.1.5 On 30 January 2014 the interest rate was decreased by 0,5%.  
Find the interest rate used before 30 January 2014. (2)
- 1.1.6 Calculate the VAT amount that is included in the monthly administration fee. (3)
- 1.1.7 Explain the term *home loan*. (2)
- 1.1.8 Choose ONE of the following statements that correctly explains why the interest amounts charged for February and March are different:  
A The interest rate changed.  
B Interest is charged on the daily outstanding balance.  
C The amount of interest decreases monthly. (2)
- 1.1.9 Due to a bank error the debit order was unpaid on 1 October 2013. The debit order was paid on 2 October 2013. The bank rectified the error by making an adjustment, as shown in the statement.  
(a) Calculate the adjustment amount. (2)  
(b) Hence, state whether this adjustment amount should be reflected as a debit or a credit. (2)
- 1.1.10 Calculate the amount of interest due on 1 April 2014 to be shown on the next statement.  
You may use the formula:  $\text{Interest} = \frac{B \times n \times r}{365}$  where  
B = balance on 1<sup>st</sup> of the previous month  
n = the number of days in the month  
r = the interest rate (3)



1.2

Khumu is planning an event to raise funds for needy learners.

Part of her plan is to find a suitable venue for about 200 to 300 people. She obtains quotations from three different service providers. Each venue had a fixed rental cost as well as a variable cost per person.

TABLE 1 below shows the costing structure of these three venues.

**TABLE 1: VENUE COSTING STRUCTURE**

VENUE	FIXED RENTAL COST	VARIABLE COST PER PERSON
Avon	R3 000	R75
Beach Hotel	R6 000	R45
Castle	R11 000	R25

The graphs representing the total cost of the three venues are given on ANSWER SHEET 1.

Use the information in the table above and the graphs on ANSWER SHEET 1 to answer the questions that follow.

1.2.1 Explain the term *variable cost* in this context. (2)

1.2.2 Calculate the exact total cost of renting the Beach Hotel venue for 230 people.

You may use the following formula:

$$\text{Total cost (in rand)} = \text{fixed cost} + 230 \times \text{variable cost} \quad (3)$$

1.2.3 Determine:

(a) The cheapest venue if only 90 persons attend the event (2)

(b) The maximum number of people that can attend the event if the total cost of the venue is R15 000 (2)

1.2.4 Khumu sells the tickets for R150 each.

(a) Draw the income graph from the sale of up to 200 tickets on the same grid as the total cost graphs on ANSWER SHEET 1. (4)

(b) Calculate the total profit to be made if she rents the Castle venue and pays for 250 people, but sells only 194 tickets. (5)

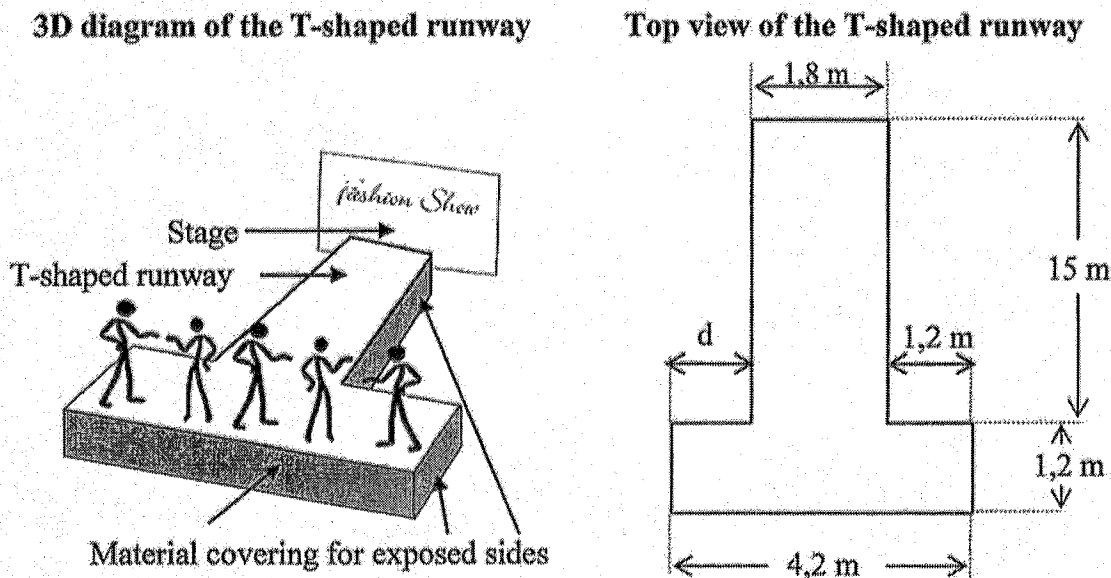
[43]



## QUESTION 2

2.1

Kataryna is planning a fashion show and intends using the school hall for the event. The hall has a stage and she plans to have a raised T-shaped platform, called a runway, erected in front of the stage, as shown in the diagrams below.



The SEVEN exposed rectangular sides of the T-shaped runway will be covered with material. The top of the runway will be carpeted. The total length of the runway is equal to  $\frac{1}{3}$  of the length of the hall.

[Adapted from [www.jerichostage.com](http://www.jerichostage.com)]

2.1.1 Calculate:

- The missing value  $d$  (in mm) (3)
- The total length (in mm) of the exposed sides of the runway (3)
- The area (in  $m^2$ ) of the runway that needs to be covered with carpet

You may use the following formula:

$$\text{Area of a rectangle} = \text{length} \times \text{width} \quad (4)$$

- The length (in m) of the hall (3)

2.1.2 Harry, a British model, wants to know the measurement (in feet) of the front end of the runway.



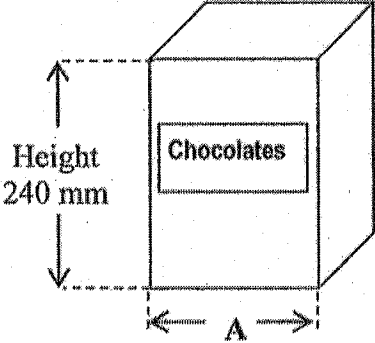
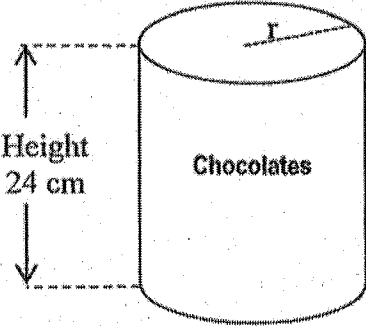
Convert 4,2 m to feet, rounded off to one decimal place.

NOTE: 1 foot = 0,3048 m (3)



2.2

The organisers of the fashion show decide to hand out chocolates to the audience at the entrance. The pictures and diagrams below show the two different containers in which the chocolates will be packed.

Pictures of different containers	
<b>Container with a square base</b> 	<b>Cylindrical container</b> 
Diagram of different containers	
 Volume = 3 456 cm <sup>3</sup>	 Radius (r) = 7 cm

2.2.1 Determine A, the length (in cm) of ONE side of the square base.

You may use the following formula:

$$\text{Volume of box with square base} = (\text{side})^2 \times \text{height} \quad (4)$$

2.2.2 The organisers of the fashion show want to use their own label around the outer curved side of the cylindrical container. The label will be 1 cm longer than the circumference of the circular base to allow for an overlap.

Determine the total area (to the nearest cm<sup>2</sup>) of all the labels that will be required for 76 cylindrical containers.

You may use the following formula:

$$\text{Area of one label (in cm}^2\text{)} = [1 + 2\pi \times r] \times \text{height} \quad (4)$$

using  $\pi = 3,142$

2.2.3 Show, with calculations, that the volume of the cylindrical container is 238,99 cm<sup>3</sup> more than the volume of the container with the square base.

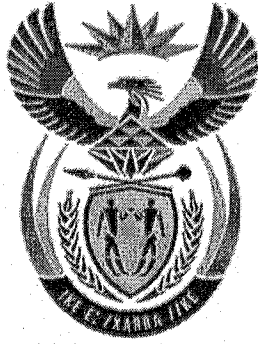
You may use the following formula:

$$\text{Volume of cylinder} = \pi \times r^2 \times \text{height} \quad \text{using } \pi = 3,142 \quad (3)$$

2.2.4 State the most appropriate metric unit of measure for the mass of a container of chocolates.

(2)  
[29]





# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICAL LITERACY P1**

**ADDENDUM**

**NOVEMBER 2016**

**This addendum consists of 5 pages.**



ANNEXURE A  
QUESTION 1.1

BOOYSEN M 52 BOS STREET BLOEMFONTEIN	Bank Home Loans 1 Enterprise Road, Fairland, 2170 PO Box 1065 Johannesburg, 2000 Enquiries: homeloans@co.za	
<b>Home Loan Statement as on 22 March 2014</b>		
<b>Bonded property:</b> Stand 20964, Pellissier 52 Bos Street Bloemfontein	<b>ACCOUNT SUMMARY</b>	
	<b>Loan Details</b>	
	Registered bond amount	R 466 000,00Dr
	Balance outstanding	R 378 123,87Dr
	Insured value of property	R 1 185 627,28
	<b>Term of loan</b>	
	Remaining loan term	12 years 4 months
	Loan end date	***
	<b>Interest rate</b>	
	Current interest rate	7,25%
	<b>Monthly repayment breakdown</b>	
	Basic repayment	R 3 842,45Dr
	House insurance premiums	R 454,37Dr
Administration fee (including VAT)	R 5,70Dr	
<b>Total repayment</b>	<b>R 4 302,52Dr</b>	

**Notice: Unpaid debit orders dated 1 October 2013**

Due to a bank error the debit order was unpaid on 1 October 2013. The debit order was paid on 2 October 2013. The bank rectified the error by making an adjustment of one day's interest on the debit order amount to the relevant accounts on 14 October 2013. The bank apologises for the error.

**Home Loan Transaction History from 22 September 2013 to 22 March 2014**

Transaction date	Description	Debits R	Credits R	Balance R
22 Sep 2013	Opening balance	385 127,06		385 127,06Dr
01 Oct 2013	Interest	2 137,43		387 264,49Dr
01 Oct 2013	#Monthly administration fee	5,70		387 270,19Dr
01 Oct 2013	Debit order		4 111,06	383 159,13Dr
01 Oct 2013	Unpaid debit order	4 111,06		387 270,19Dr
02 Oct 2013	Debit order		4 111,06	383 159,13Dr
14 Oct 2013	Adjustment			383 158,37Dr
28 Oct 2013	House owner's insurance	5 275,04		388 433,41Dr
01 Nov 2013	Interest	2 201,26		390 634,67Dr
01 Nov 2013	#Monthly administration fee	5,70		390 640,37Dr
01 Nov 2013	Debit order		4 200,42	386 439,95Dr
01 Dec 2013	Interest	2 143,95		388 583,90Dr
02 Dec 2013	#Monthly administration fee	5,70		388 589,60Dr
02 Dec 2013	Debit order		4 200,42	384 389,18Dr
01 Jan 2014	Interest	2 204,43		386 593,61Dr
02 Jan 2014	# Monthly administration fee	5,70		386 599,31Dr
02 Jan 2014	Debit order		4 200,42	382 398,89Dr
01 Feb 2014	Interest	2 203,50		384 602,39Dr
01 Feb 2014	#Monthly administration fee	5,70		384 608,09Dr
01 Feb 2014	Debit order		4 302,52	380 305,57Dr
01 Mar 2014	Interest	2 115,12		382 420,69Dr
01 Mar 2014	#Monthly administration fee	5,70		382 426,39Dr
01 Mar 2014	Debit order		4 302,52	378 123,87Dr
22 Mar 2014	Closing balance			378 123,87Dr

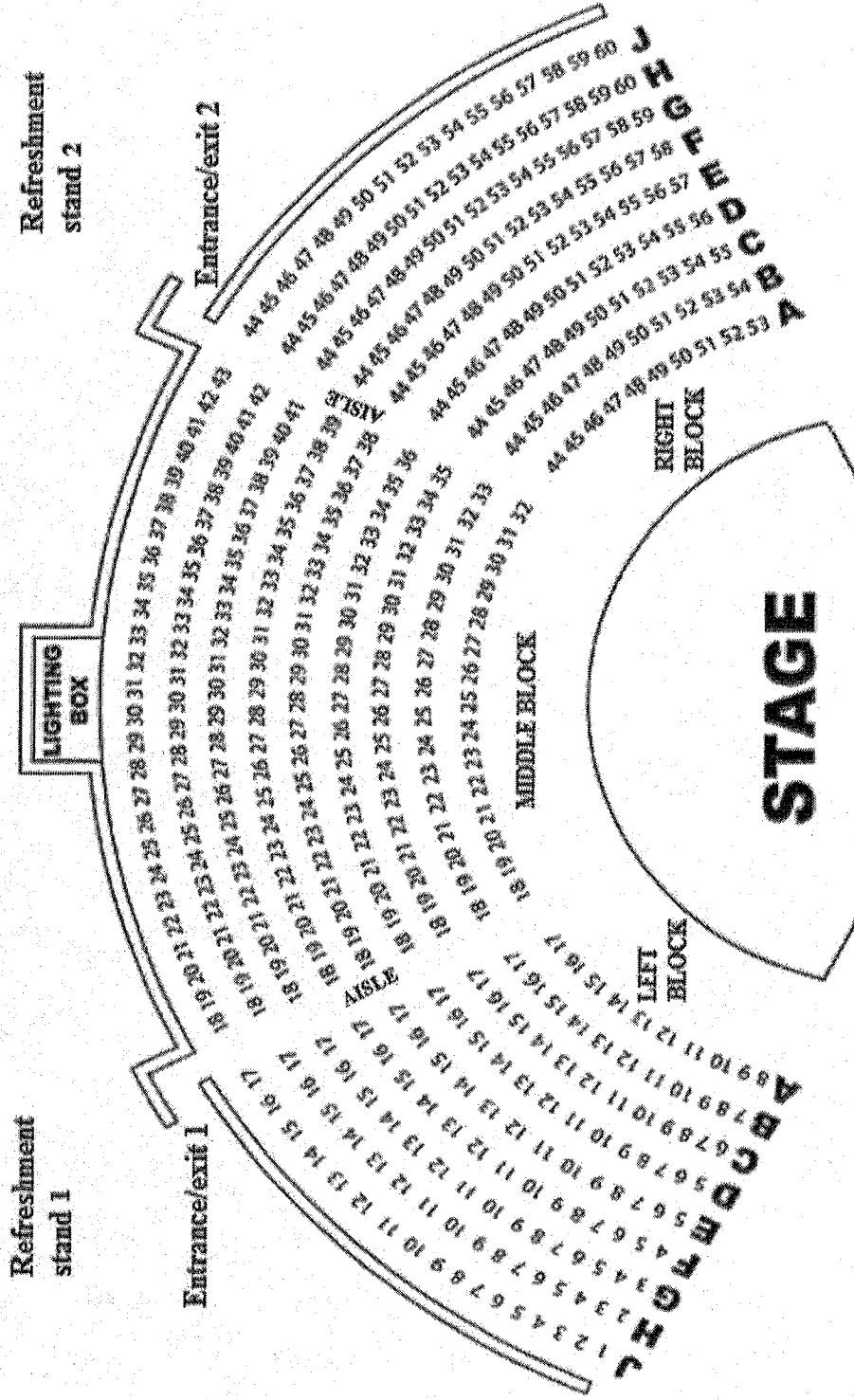




ANNEXURE B

QUESTION 3.1

SEATING PLAN OF AN OPEN-AIR ARENA WITH 432 SEATS



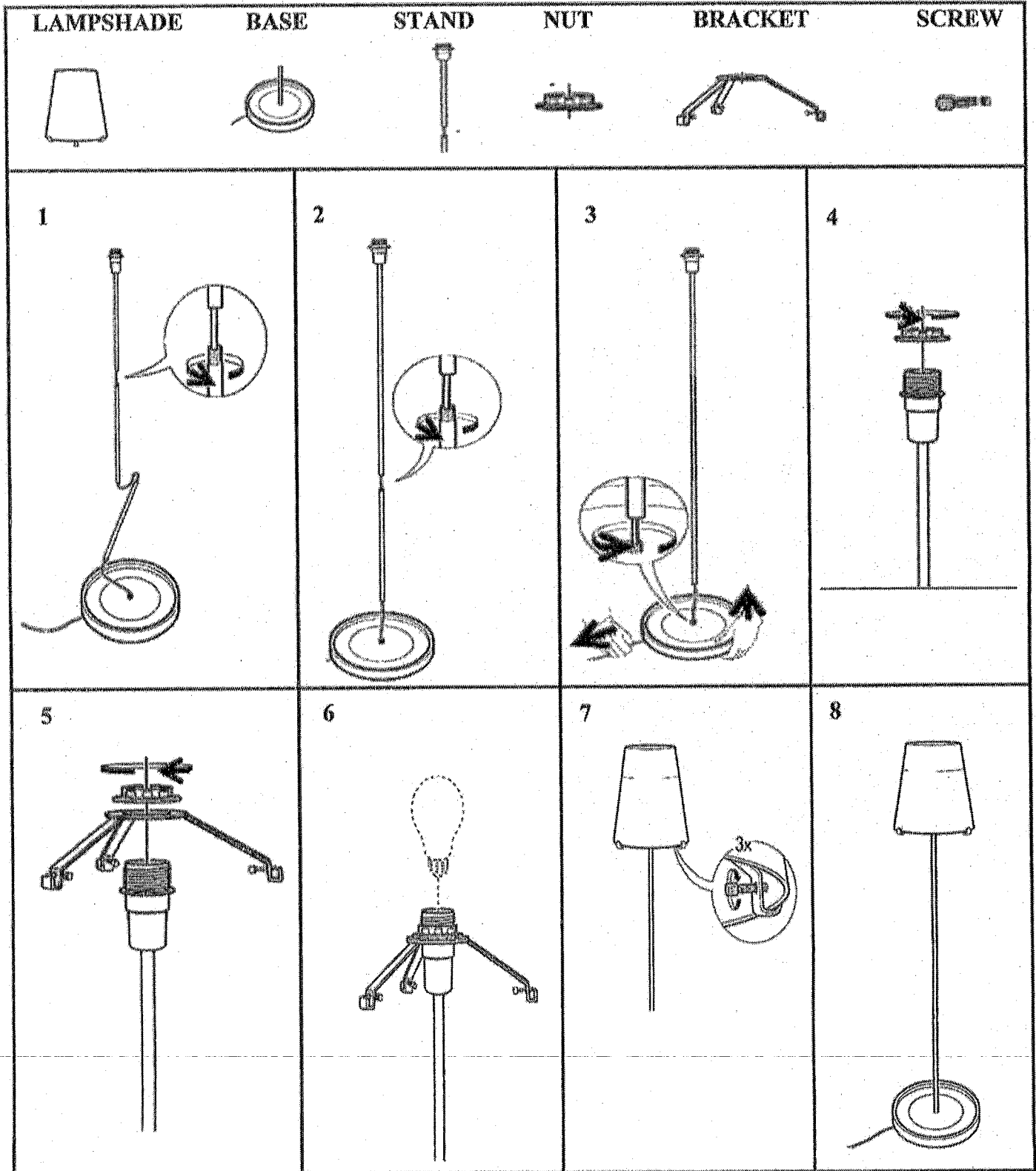
[Source: [www.oudeliberitas.co.za](http://www.oudeliberitas.co.za)]



ANNEXURE C

QUESTION 3.2

ASSEMBLY DIAGRAMS FOR A FLOOR LAMP

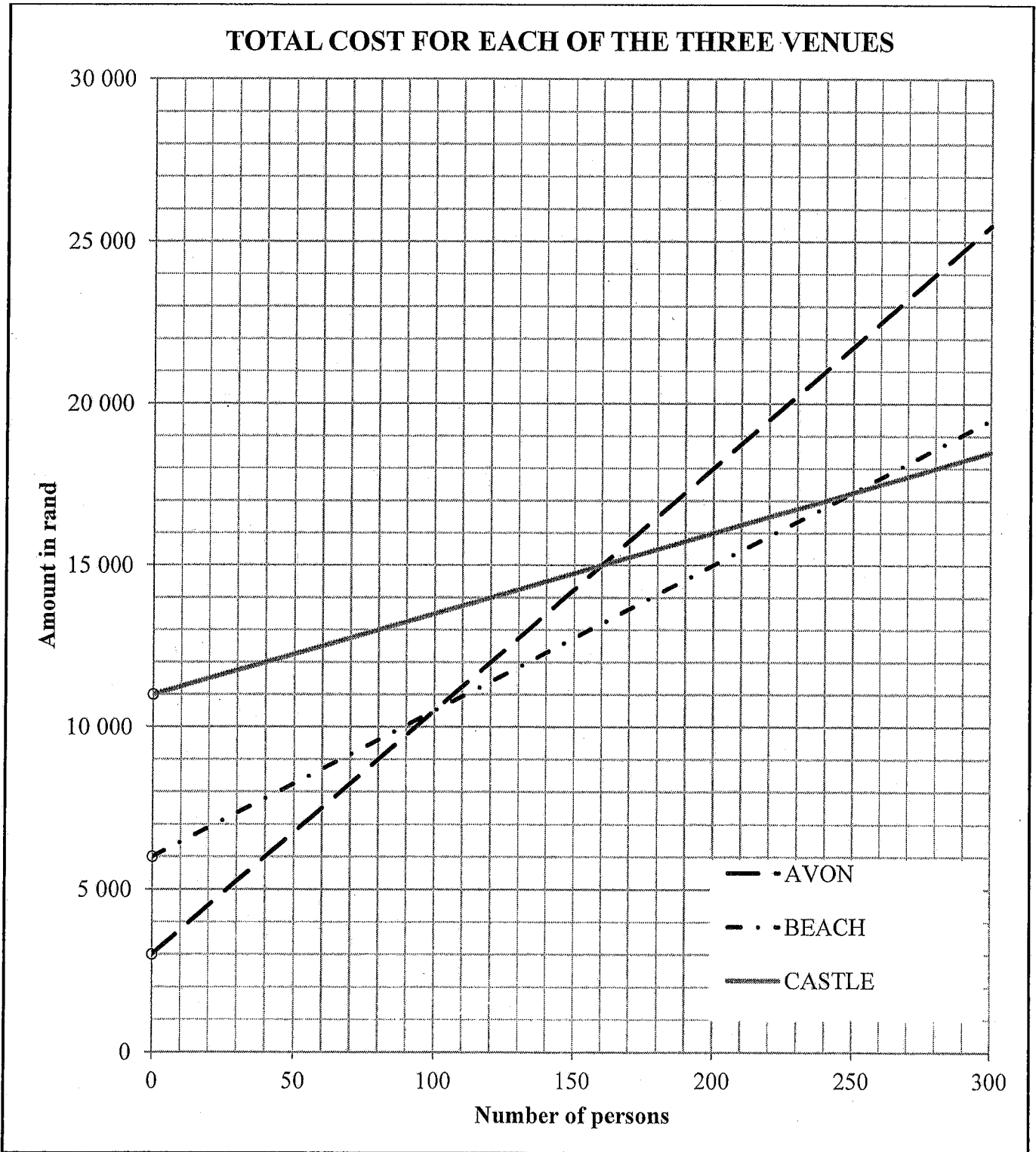


ANSWER SHEET 1

CENTRE NUMBER:

EXAMINATION NUMBER:

QUESTION 1.2.4(a)

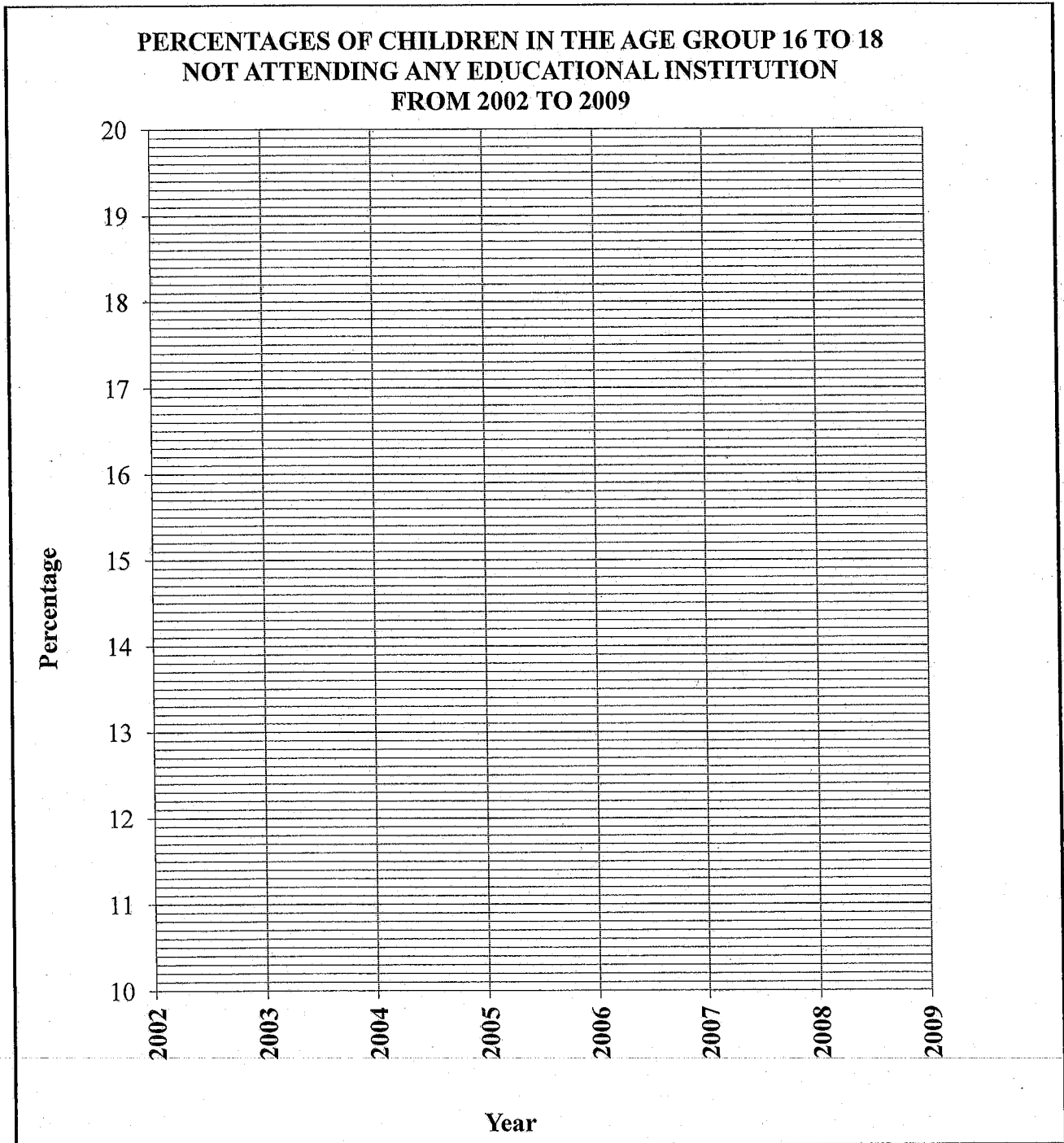


**ANSWER SHEET 2**

**CENTRE NUMBER:**

**EXAMINATION NUMBER:**

**QUESTION 4.2.6**



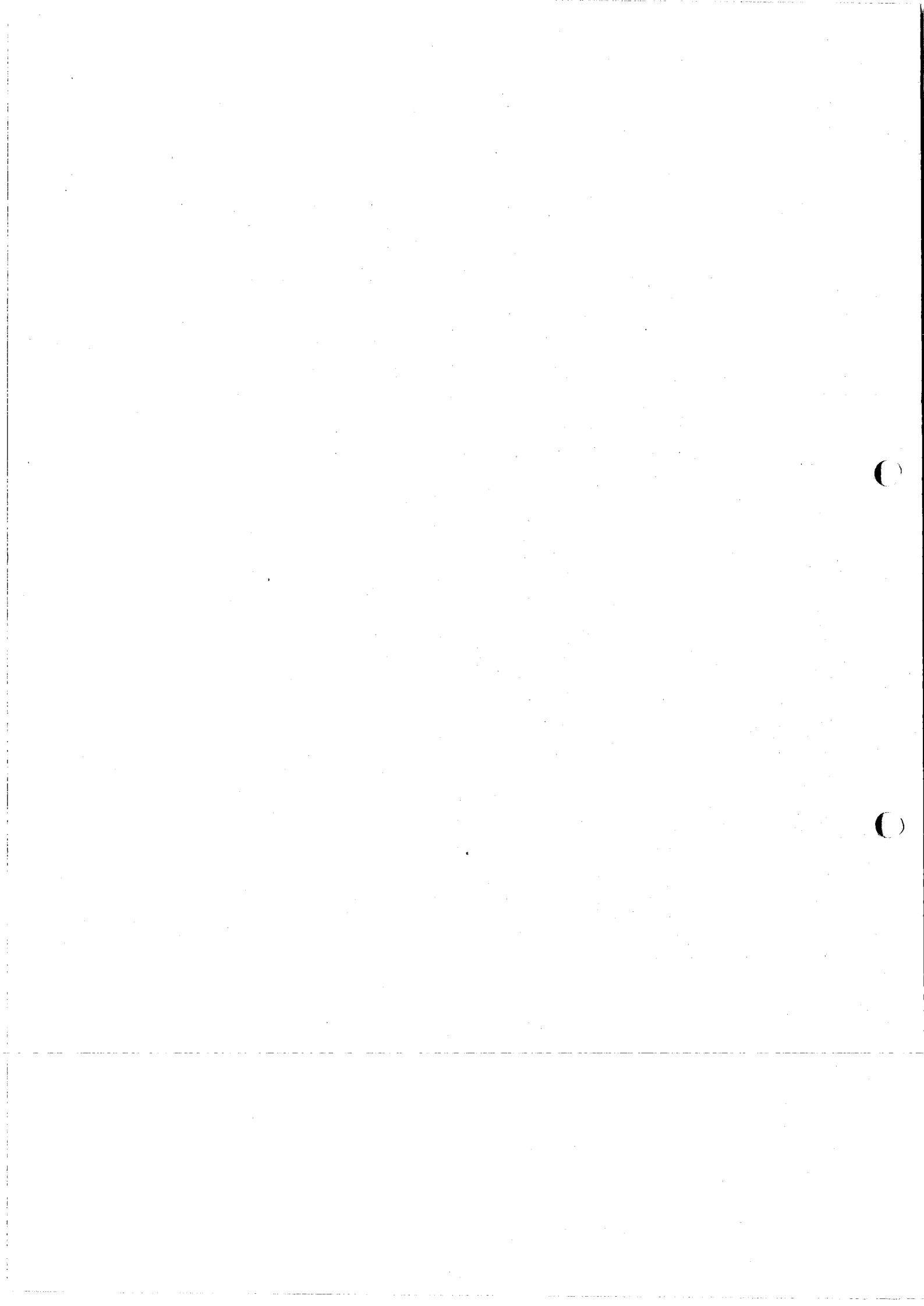
## ANNEXURE D

## QUESTION 5

TABLE 4: AVERAGE LOCAL PRICE OF A BIG MAC BURGER AND A 2-LITRE COLA WITH EXCHANGE RATES AS ON 30 APRIL 2016

COUNTRY	EXCHANGE RATES (AS ON 30/04/2016)	2 L COLA	BIG MAC BURGER	BIG MAC BURGER PRICE IN RAND (R)
South Africa		R16	R50	R50
Brazil	1 Brazilian real equals 4,14 South African rand	R\$ 5,81	R\$ 23	R95,22
China	1 South African rand equals 0,46 Chinese yuan	¥ 7	¥ 32	R69,57
Egypt	1 Egyptian pound equals 1,60 South African rand	E£ 8	E£ 39	R62,40
India	B	Rs 74	Rs 267	R56,07
Germany	1 euro equals 16,28 South African rand	€ 1,68	A	R113,96
New Zealand	1 New Zealand dollar equals 9,93 South African rand	NZ\$ 3,40	NZ\$10	R99,30
Singapore	1 South African rand equals 0,095 Singaporean dollar	SGD \$ 2,50	SGD \$ 8,00	R84,21
United Arab Emirates	1 United Arab Emirates dirham equals 3,87 rand	Dh 4,82	Dh 24	R92,88
United Kingdom	1 South African rand equals 0,048 British pound	£ 1,80	£ 5,70	R118,75
United States of America	1 South African rand equals 0,070 US dollar	\$ 1,94	\$ 6,69	R95,57

[Source: [www.expatisan.com](http://www.expatisan.com) > cost of living]



## QUESTION 4

4.1

The motorcycle land-speed record is the fastest speed achieved by a motorcyclist on land.

TABLE 2 below shows the motorcycle land-speed records from 1930 to 2010.

**TABLE 2: MOTORCYCLE LAND-SPEED RECORDS IN MILES PER HOUR**

YEAR	SPEED	RIDER	YEAR	SPEED	RIDER
1930	137,23	Joseph S Wright	1956	214,50	John Allen
1930	137,58	Ernst J Henne	1962	224,57	William Johnson
1930	150,65	Joseph S Wright	1966	245,67	Robert Leppan
1932	151,77	Ernst J Henne	1970	254,84	Cal Rayborn
1934	152,81	Ernst J Henne	1975	302,92	Don Vesco
1935	159,01	Ernst J Henne	1978	318,60	Don Vesco
1936	168,92	Ernst J Henne	1990	322,15	Dave Campos
1937	169,68	Eric Fernihough	2006	342,80	Rocky Robinson
1937	170,27	Piero Taruffi	2006	350,88	Chris Carr
1937	173,68	Ernst J Henne	2008	360,91	Rocky Robinson
1951	180,29	Wilhelm Herz	2009	367,38	Chris Carr
1955	184,83	Russell Wright	2010	376,36	Rocky Robinson
1956	193,73	John Allen			

[Adapted from Wikipedia/Landspeedrecords]

Use TABLE 2 to answer the questions that follow.

- 4.1.1 Determine the difference between the highest and lowest land-speed records that were set between 1950 and 2000. (3)
- 4.1.2 Determine the number of riders that set new land-speed records from 1930 to 2010. (2)
- 4.1.3 Identify the TWO years during which the land-speed record remained unbroken for the longest time AND also state the number of years the record remained unbroken. (3)
- 4.1.4 Name the rider that held the land-speed record the most number of times AND also state how many times this rider held the record. (3)
- 4.1.5 Determine the probability (as a percentage) of randomly selecting a land-speed record in TABLE 2 that was set during the 21<sup>st</sup> century. (3)



## QUESTION 3

3.1

Rahim's favourite band is performing at an open-air arena. The seating plan of the arena is shown in ANNEXURE B.

Use ANNEXURE B to answer the questions that follow.

- 3.1.1 Determine the total number of seats available in the middle block. (3)
- 3.1.2 Give the compass direction from seat E12 towards the stage. (2)
- 3.1.3 Rahim is seated exactly in the middle of a row in the middle block. The row he is seated in has an odd number of seats and is furthest from the stage.  
Name the row and seat number where he is seated. (3)
- 3.1.4 Mali is seated at D14. She decides to go to the refreshment stand which is directly east of the lighting box.  
Give the directions for the route from her seat to the refreshment stand. (4)
- 3.1.5 Determine the probability of randomly choosing a spectator to join the band on the stage if  $87\frac{1}{2}\%$  of all the seats in the arena are occupied. (3)
- 3.1.6 It is predicted that it is most unlikely that it will rain on the night of the performance. Choose ONE of the values below that best describes this probability:  
1,0       $\frac{1}{2}$       0,0      40%       $\frac{3}{5}$       0,8      20% (2)

3.2

ANNEXURE C shows the assembly diagrams for a floor lamp.

Use ANNEXURE C to answer the questions that follow.

- 3.2.1 Refer to DIAGRAM 4.  
(a) Must the nut be screwed or unscrewed? (2)  
(b) Give the direction in which the nut should be turned. (2)
- 3.2.2 How many screws are needed to assemble the lamp shade? (2)
- 3.2.3 Which diagram is associated with the instruction: 'Join the stand to the base.'? (2)
- 3.2.4 The total height of the floor lamp in the picture is 62 mm.  
Determine the actual height (in m) of the floor lamp if the scale of the diagram is 1 : 30. (3)

[28]





**QUESTION 5**

One of the ways to compare the purchasing power of one country's currency to another country's currency is to compare the local price of common items that are available in all the countries.

The average local price of a Big Mac burger and a 2 ℓ cola as well as the exchange rates are given in TABLE 4 in ANNEXURE D.

Use ANNEXURE D to answer the questions that follow.

- 5.1 Identify the country that has the strongest currency in comparison to the rand. (2)
- 5.2 Calculate the price in rand that you will pay for a 2 ℓ cola in the United States of America. (2)
- 5.3 Determine the missing values:
- 5.3.1 A (2)
- 5.3.2 B, the value of ONE Indian rupee in rand (2)
- 5.4 Determine the simplified ratio of the Singapore price of a Big Mac Burger to a 2 ℓ cola. (3)
- 5.5 Identify the TWO countries that have almost similar purchasing power. (2)
- 5.6 Define the term *median*. (2)
- 5.7 Use the prices in rand for a Big Mac Burger to do the following:
- 5.7.1 Arrange the data in descending order (2)
- 5.7.2 Calculate the mean price (3)

**[20]****TOTAL: 150**

4.2

TABLE 3 below shows the numbers and percentages of children from three age groups who did not attend any South African educational institution from 2002 to 2009.

**TABLE 3: NUMBERS AND PERCENTAGES OF CHILDREN NOT ATTENDING ANY SOUTH AFRICAN EDUCATIONAL INSTITUTION FROM 2002 TO 2009**

Year	AGE GROUPS					
	7 to 15		16 to 18		7 to 18	
	Number of children	%	Number of children	%	Number of children	%
2002	345 501	3,7	514 534	17,6	860 035	7,0
2003	265 328	2,8	522 914	17,2	788 242	6,4
2004	216 678	2,3	520 016	17,3	736 694	6,3
2005	209 309	2,2	539 177	17,8	A	6,0
2006	227 324	2,4	551 628	17,5	778 951	6,2
2007	200 520	2,1	477 411	14,8	677 931	5,4
2008	194 901	B	525 200	16,2	720 101	5,7
2009	142 843	1,5	519 576	16,7	662 419	5,3

[Adapted from [www.statssa.co.za](http://www.statssa.co.za)]

Use TABLE 3 to answer the questions that follow.

- 4.2.1 State why the data for the number of children is regarded as discrete data. (2)
- 4.2.2 Identify the age group where the majority of children did not attend any educational institution. (2)
- 4.2.3 Give the year during which the age group 16 to 18 showed the best attendance. (2)
- 4.2.4 Determine the missing value A. (2)
- 4.2.5 Determine the missing value B, if the total number of children in that age group was 9 281 000 in 2008. (3)
- 4.2.6 Draw a broken line graph on ANSWER SHEET 2 to represent the percentage of children in the age group 16 to 18 not attending any educational institution from 2002 to 2009. (5)

[30]

