



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2012

MATHEMATICAL LITERACY: PAPER I

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 14 pages, SIX questions and an Answer Booklet of 4 pages (i – iv). Detach the Answer Booklet from the centre of the question paper. Hand it in with your Answer Book.
 2. Ensure that your question paper is complete.
 3. Answer ALL the questions.
 4. Start each question on a new page.
 5. Number the answers exactly as the questions are numbered.
 6. An approved calculator (non-programmable and non-graphical) may be used.
 7. ALL necessary calculations must be clearly shown.
 8. Units of measurement must be indicated where applicable.
 9. It is in your own interest to write neatly and legibly.
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QUESTION 1

1.1 Calculate:

1.1.1 $\frac{4}{5} \times (71 - 48)^2 + 1,8$ (2)

1.1.2 35% of R350 (2)

1.2 Decrease 700 g by 15%. (2)

1.3 Write 1,28 as a common fraction in simplest form. (2)

1.4 Simplify 104 : 13 (2)

1.5 It takes Cindy 24 minutes to run a distance of 3 km. If she continued running at the same pace, how long would it take her to run a distance of 12 km? (2)

1.6 Convert 12,2 hours to hours and minutes. (2)

1.7 An item cost R550,45 including 14% VAT (Value Added Tax). Calculate the cost of the item excluding VAT. (3)

1.8 At a local shop, bread rolls cost R1,15 each. Calculate the cost for $2\frac{1}{2}$ dozen bread rolls. (2)

1.9 Which of the following options gives the best value for money? Show your calculations to justify your answer.

Option 1



2,5 kg will cost R17,99

Option 2



5 kg will cost R36,99

Option 3

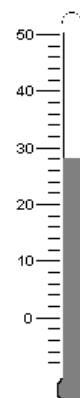


10 kg will cost R74,99

(3)

1.10 Matthew goes swimming. The thermometer alongside shows the water temperature, in °C, of the pool.

Write down the temperature of the water.



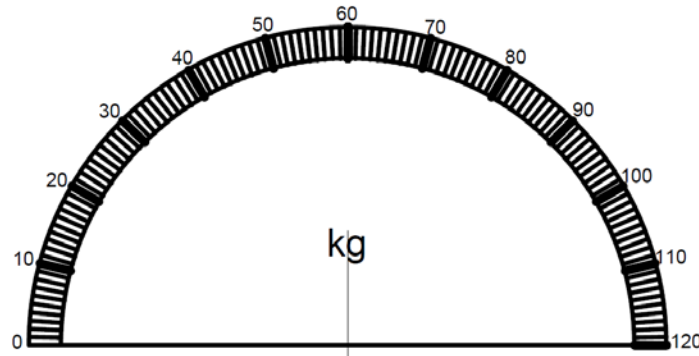
(2)

1.11 Lebogang was very proud of herself when she started exercising and her body mass decreased by 25 pounds.

1.11.1 If $1 \text{ kg} = 2,2 \text{ pounds}$, calculate how many kilograms 25 pounds is. (2)

1.11.2 If Lebogang's body mass was 92 kg, what is her body mass now? (1)

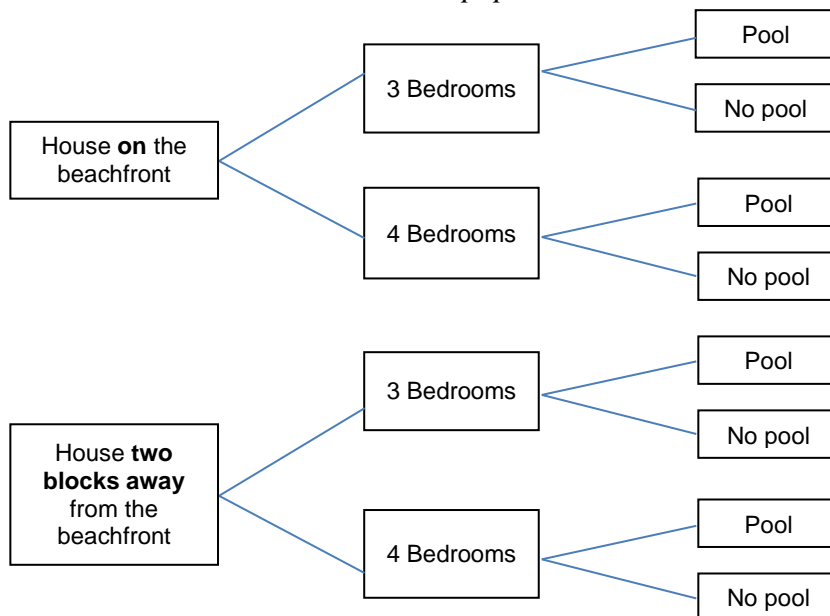
1.11.3 **Use the Answer Booklet to answer this question.** Show Lebogang's new body mass on the given scale by accurately drawing a line from the centre to the perimeter of the semi-circle. (2)



1.12 The distance between two points on a map drawn to scale is 4,1 cm. Determine the actual distance, in kilometers, if the map has a scale of 1: 50 000. (3)

1.13 The tree diagram below shows the choices that a particular group of students have with regards to *RAGE accommodation.

**RAGE is the name given to the celebration holiday some matriculants have once they have written their last examination paper.*



1.13.1 How many different accommodation options are available to this group of students? (1)

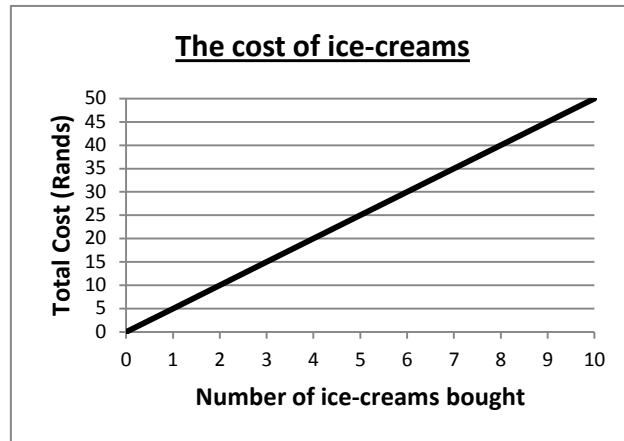
1.13.2 How many different accommodation options are available if the students want to stay in a house with four bedrooms? (2)

1.13.3 List any TWO accommodation options with a pool the students could choose. (2)

QUESTION 2

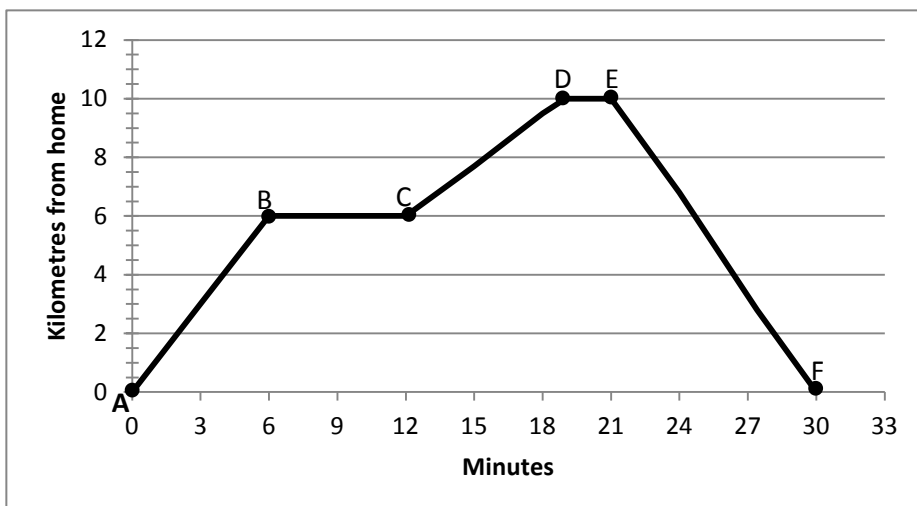
In each case, state whether the following statements are TRUE or FALSE:

- 2.1 All direct proportion graphs are straight line graphs. (1)
- 2.2 The point where an income and expense graph intersect is called the break-even point. (1)
- 2.3 The independent variable is plotted on the 'y' (vertical) axis. (1)
- 2.4



According to the graph above:

- 2.4.1 The cost of 4 ice-creams is R25,00. (1)
- 2.4.2 It would cost R45,00 for 9 ice-creams. (1)
- 2.5 The graph below illustrates a trip that Mkizi and Pieter took.



According to the graph above:

- 2.5.1 The entire trip took them 10 minutes. (1)
- 2.5.2 The furthest distance they travelled is 12 km from home. (1)
- 2.5.3 Between points B and C they were driving very fast. (1)

- 2.5.4 Sections A to B and C to D indicate that Mkizi and Pieter were driving uphill. (1)
 - 2.5.5 It took them exactly 18 minutes to reach point D. (1)
 - 2.5.6 They reached their destination at point F. (1)
 - 2.5.7 They stopped twice on their trip. (1)
 - 2.5.8 For the first part of their trip, point A to B, it took them 6 minutes to drive 6 km. (1)
- [13]**

QUESTION 3

The Grade 12s of Ridge High School are excited about getting their matric jackets. They have done some research and found two companies that will make their jackets.

The two companies are *Jackets-R-Us* and *Wear It Well*.

Jackets-R-Us have a fixed cost of R2 500,00 plus R200,00 per jacket.

Wear It Well just charge R225,00 per jacket.

The table below shows the total cost for each company if the given number of jackets are ordered:

Number of jackets ordered	10	20	50	150	200
A	R2 250	R4 500	C	R33 750	R45 000
B	R4 500	R6 500	R12 500	R32 500	D

- 3.1 Which company is represented by the letter A, and which company is represented by the letter B? (2)
- 3.2 Calculate the missing values C and D. (5)
- 3.3 **Use the Answer Booklet to answer this question.**
The graph showing the cost of ordering jackets from Company A has already been drawn.
 - 3.3.1 Label the axes. (2)
 - 3.3.2 Draw the graph representing the cost of the jackets from Company B on the **same set of axes**. (4)
 - 3.3.3 Give the graphs a heading. (1)

3.4 Use your graphs in the Answer Booklet to answer the following questions:

3.4.1 Determine the approximate cost if 55 jackets were ordered from Company A. (2)

3.4.2 Determine the approximate number of jackets ordered from Company A if it costs Ridge High School R32 000,00. (2)

3.4.3 Which company will be the cheapest to order 30 jackets from? State how the graphs illustrate this. (2)

3.4.4 Determine the number of jackets that need to be ordered for the cost to be the same for both companies. Label this point on your graph with a letter 'E'. (2)

3.5 One of the students at Ridge High School found out that it only cost *Wear It Well* R75,00 to manufacture each jacket.

Use the formula below to calculate the percentage profit that *Wear It Well* will make on each jacket.

$$\text{Percentage Profit} = \frac{\text{Profit}}{\text{Cost Price}} \times 100\% \quad (4)$$

3.6 One of the employees at *Wear It Well* needs to borrow some money. The manager agrees to lend him R3 000,00 which he must repay (with interest) in 12 equal monthly instalments. The simple interest rate is 5% per year.

3.6.1 Use the formula below to calculate the total amount the employee must repay.

$$A = P(1 + i.n)$$

Where $A =$ Final (Accumulated) amount
 $P =$ Principal amount borrowed
 $i =$ Interest rate per year
 $n =$ Period in years

(3)

3.6.2 Calculate the amount to be repaid monthly. (2)

[31]

QUESTION 4

Freedom of the Seas is a passenger cruise ship, as shown in the picture below.

It can accommodate a maximum of 3 634 passengers and has a crew (persons who work on the ship) of 1 360.



- 4.1. The total length of the ship is 1 111,9 feet.
 - 4.1.1 If 1 foot = 0,305 m calculate the length of the ship to the nearest metre. (3)
 - 4.1.2 The average length of a car is 4,13 m. Approximately how many cars could be lined up to equal the length of this cruise ship? (2)
- 4.2 The ship travels at an average speed of 40 km/h. Calculate the distance it would travel in 24 hours if it does not stop.

Average Speed = Distance ÷ Time (2)
- 4.3 The largest suite, the Presidential Suite, can accommodate 14 people, has ten flat screen TVs, a private swimming pool and even a piano!

The floor area of the rectangular Presidential Suite is 113 square metres. If the total floor length is 11,3 m, calculate the width of the floor. (2)
- 4.4 Cabins (rooms) for the maiden (first) voyage were priced from \$1 900 to \$22 000 for the week.
 - 4.4.1 Calculate the difference in price (in \$), between the most expensive cabin and the cheapest cabin. (1)
 - 4.4.2 If \$1 = R7,9234 calculate the price difference in Rands. (2)

4.5 During a typical **7 day** cruise, the passengers and the crew of this ship consume the following quantities of food:

- 105 000 meals and 300 680 desserts
- 5 400 kg of chicken
- 29 000 kg of fresh vegetables
- 16 000 kg of fresh fruits
- 18 000 slices of pizza
- 30 000 ℓ of ice cream
- 680 kg of coffee and 5 700 ℓ of milk
- 11 500 cans of soft drinks
- 35 000 kilograms of ice **daily**

4.5.1 Calculate the total cost of chicken for 7 days if chicken costs R32,95/kg. (2)

4.5.2 How many litres of soft drinks are consumed in 7 days if one can holds 340 ml? (3)

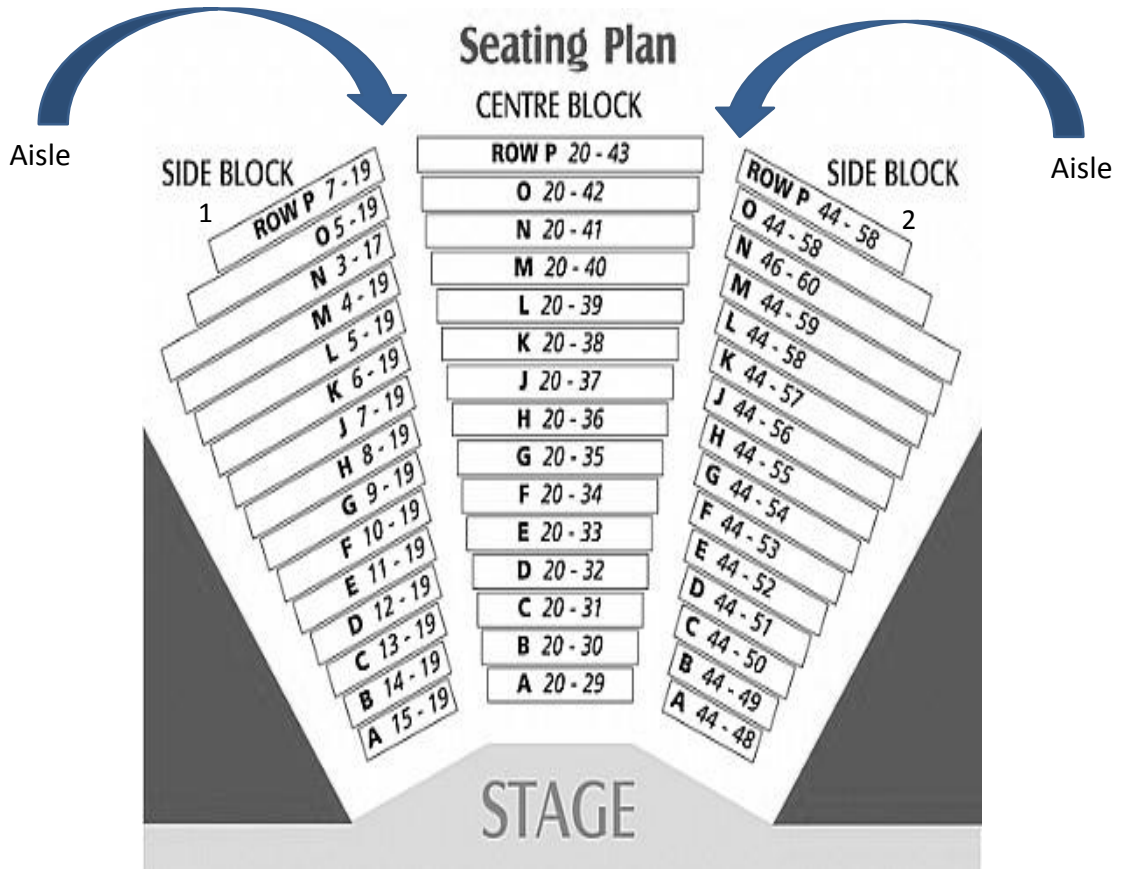
4.5.3 The following table shows the daily milk consumption.

Day 1	800 ℓ
Day 2	1 100 ℓ
Day 3	900 ℓ
Day 4	400 ℓ
Day 5	750 ℓ
Day 6	950 ℓ
Day 7	A

(a) Calculate the missing value A. (2)

(b) **Use the Answer Booklet to answer this question.** Use the grid provided to draw a line graph representing the number of litres of milk available at the **beginning** of each day. (7)

4.6 Below is a diagram of the seating plan for one of the entertainment areas on the ship.



Refer to the seating plan in order to answer the following questions:

4.6.1 How many seats are available in Row H of Side Block 1? (1)

4.6.2 Mr and Mrs King were seated in Row D of the Centre Block. Their friends, Mr and Mrs Jones, had aisle seats 4 rows behind them. Side Block 2 was on their left when they faced the stage. What were Mr and Mrs Jones' seat numbers? (2)

4.7 The map below shows the route the *Freedom of the Seas* cruise ship travels.

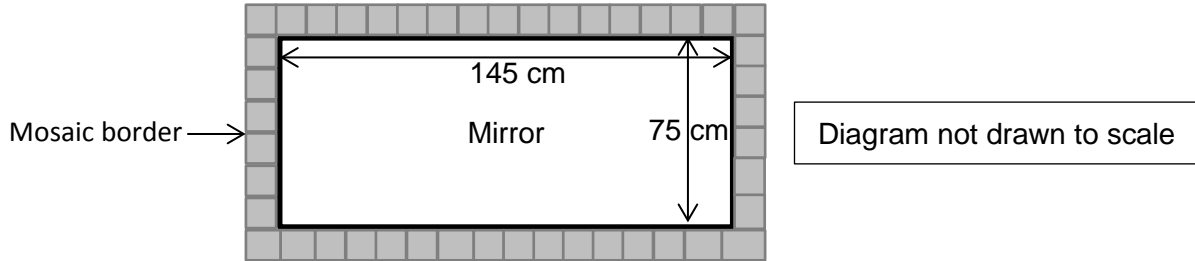


If the ship departs from Port Canaveral and sails to Labadee, would it be travelling in a North-Westerly, a South-Easterly or a North-Easterly direction?

(1)
[30]

QUESTION 5

Mrs Pillay would like to create a mosaic border around her bathroom mirror as shown in the diagram below.



The dimensions of one square mosaic tile are 25 mm by 25 mm.

- 5.1 Calculate the perimeter of the mirror. (3)
 - 5.2 Calculate how many mosaic tiles Mrs Pillay will need in order to create her border? (4)
 - 5.3 If Mrs Pillay decides to create a second row of mosaic tiles for her border, calculate the total amount of tiles she would need then. (5)
 - 5.4 The shop sells mosaic tiles in boxes of 20. Calculate how many boxes Mrs Pillay will need to buy if she creates two rows of mosaic tiles. (2)
- [14]**

QUESTION 6

Sunday Times
GENERATION NEXT
 8 - 22 YOUTH BRAND SURVEY

ALL YOU NEED TO KNOW ABOUT YOUTH & BRANDS

What is the Sunday Times Generation Next Survey?

Keeping track of how youth interact with, and respond to, brands is an ongoing process. Now in its seventh year, the Sunday Times Generation Next Study is the leading annual youth brand preference and consumer behaviour survey.

This year's study polled the opinions of 7 242 of South Africa's youth (age 8-22) in February - March 2011 in urban and peri-urban environments in six provinces. The intensive research analysis is conducted by HDI Youth Marketeers in conjunction with academic validation partner, Monash South Africa and statistician, Dr. Arien Strasheim.

[Source: GenNext2011 – brochure.pdf.]

Over 7 200 young South Africans from across six provinces were quizzed on what they consider to be the 'coolest' ranging from fast food outlets to fashion brands. Over fifty percent of South Africans are under the age of 23, and they alone spent R95,3 billion in 2010.

Listed below are some of the top 3 'coolest' brands or stores as identified by the survey:

<p>Coolest Brand Overall</p> <ol style="list-style-type: none"> 1. Blackberry 2. BMW 3. Coca-Cola 	<p>Coolest Fashion & Accessory Store</p> <ol style="list-style-type: none"> 1. Mr Price 2. Edgars 3. Jay Jays
<p>Coolest Fashion Brand</p> <ol style="list-style-type: none"> 1. Nike 2. Adidas 3. Guess 	<p>Coolest Alternative Fashion Brand</p> <ol style="list-style-type: none"> 1. Uzzi 2. Aca Joe 3. Jay Jays
<p>Coolest Fast Food place</p> <ol style="list-style-type: none"> 1. KFC 2. McDonald's 3. Debonairs 	

[Adapted from <<http://10and5.com/2011/05/30/sunday-times-generation-next-2011/>>]

- 6.1 What is the exact size of the sample group surveyed? (1)
- 6.2 During which months and year did the survey take place? (2)
- 6.3 Calculate the range of ages of the youth that took part in the survey. (2)
- 6.4 Which Fast Food place came in as the second coolest according to the survey? (1)
- 6.5 Which Fashion Brand received the modal number of votes? (1)
- 6.6 The sample group consisted of the following categories of youth:
 - Kids*** : ***Primary School learners Ages 8 – 13 years***
 - Teens*** : ***High School learners Ages 14 – 18 years***
 - Young Adults*** : ***Learners attending Tertiary Institutions Ages 19 – 22 years***

Refer to the table on the next page which shows the number of the youth in each age group, per province, and the percentage of youth that participated in the survey.

The target population and sample achieved

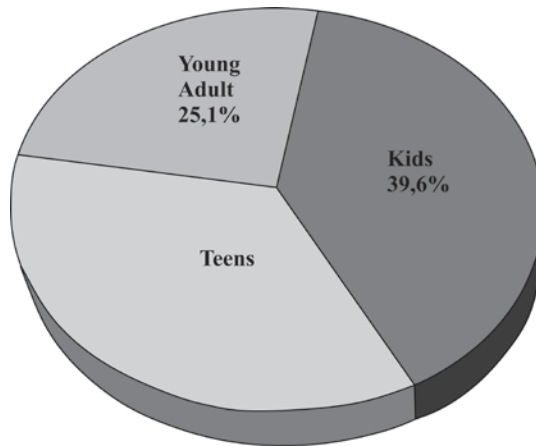
	Primary	High	Tertiary	Total	Total % population in province	Total % in actual sample
Eastern Cape	830 973	681 539	47 214	1 559 726	17.9	15.1
Free State	269 519	253 992	30 236	553 747	6.4	10.7
Gauteng	767 543	606 964	199 631	1 574 138	18.1	28.5
KwaZulu-Natal	1 162 253	972 241	105 835	2 240 329	25.7	23.4
Limpopo	677 536	628 673	35 394	1 341 603	15.4	3.3
North West	317 973	269 551	22 337	609 861	7.0	6.3
Western Cape	420 689	334 964	75 091	830 744	9.5	12.7
Total	4 446 486	3 747 924	515 738	8 710 148	100.0	100.0

[Taken from: *Sunday Times* Generation Next 2011 Methodology Report]

- 6.6.1 Which province had the highest number of 8 – 22 year olds? (1)
- 6.6.2 Which province had the highest percentage of the sample group? (1)
- 6.6.3 Which province had the lowest number of high school learners? (1)

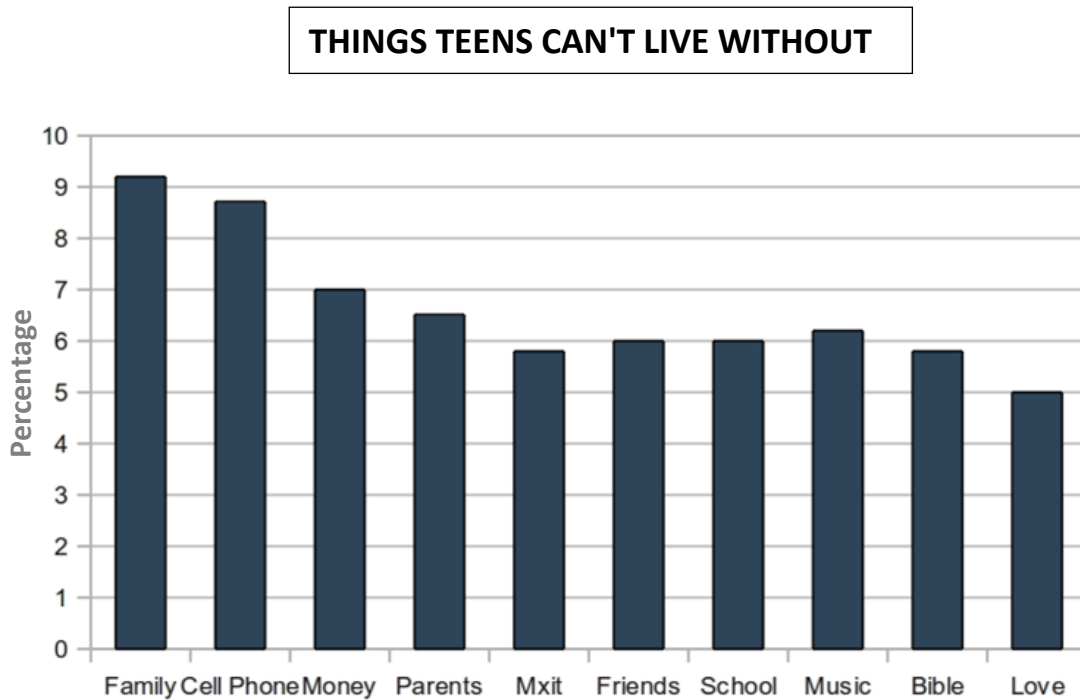
6.7 The pie chart below illustrates the 3 age group categories.

Age breakdown (%)



Calculate what percentage of the sample group were teens. (2)

6.8 The results of the survey were illustrated by means of bar graphs. The bar graph below shows what **teens** say they 'can't live without'.



[Insert from <<http://futurebible.org/wp-content/uploads/2011/06/Teens-Cant-Live-Without.png>>]

Refer to the graph to answer the following questions:

- 6.8.1 Identify the second most important 'thing' that teens can't live without. (1)
- 6.8.2 'Friends' and 'School' had the same percentage votes. Which other **two** 'things' showed the same percentage votes? (2)
- 6.8.3 Determine what percentage of teens said they could not live without music. (2)
- 6.8.4 What did 5% of the teens indicate they could not live without? (1)

6.9 **Use the Answer Booklet for this question.** Use the data given in the table below to draw a vertical bar graph, showing what the youth consider to be their coolest birthday wishes.

BIRTHDAY WISH	%
R10 000 clothing voucher	9,6
Blackberry	8,2
Laptop	7,1
Car	7
Money	6,9
Apple iPad	6,6
Driver's Licence	4,5
Play Station 3	4,5
Happiness	4,4
Clothes	4,3

(7)
[25]

Total: 150 marks