Province of the
EASTERN CAPE
EDUCATION

CURRICULUM FET

MATHEMATICAL LITERACY
2018 REVISION MATERIAL

You know what...

yes you

CAN

!

#YOU CAN DO IT!
Booklet 1 – 2018:
➢ Finance
➢ Data Handling

It does not matter what percentage you got in the past, you can collect a lot of marks if you focus and practice!

Practice makes perfect!
Collect the marks!
HARDWORK NEVER KILLS!!!!

NOTE: PLEASE USE THIS BOOKLET TOGETHER WITH OTHER REVISION MATERIAL LIKE PREVIOUS YEARS UESTION PAPERS' REVISION MATERIAL (WITH QUESTION PAPERS FROM 2015 – 2017/18 SUPP.)

FROM 2018 WINTER SCHOOL ONWARDS!

RESOURCE MATERIAL
BOOKLET 1: 2018

A.   FINANCE

CAPS DOCUMENT EXTRACT

Topic: Finance			Grades 10, 11 and 12
Suggested teaching time: Grade 10: 6–7 weeks Grade 11: 8–9 weeks Grade 12: 8–9 weeks	**Recommended texts and/or resources:** • Textbooks • Relevant financial documents relating to personal, household, workplace, business, national and global contexts and more complex financial topics (e.g. household bills; bank and store account statements; adverts showing car and home loan conditions; tax forms)		

Scope of contexts and/or content per section and grade:

Section	Grade 10	Grade 11	Grade 12
Financial documents	Contexts are limited to those that deal with personal and/or household finance	Contexts are limited to those that deal with personal, household, workplace and business finance. *Examples of contexts in which workplace and business finance can be explored:* • *small home industry (e.g. bread-baking business)* • *small business (e.g. tuck shop; street vendor; flea-market stall; cell phone container business; garden services; painting business; car wash; catering business; crèche)* • *subsistence farming* • *outreach programme or non-profit organisation* • *business banking* • *etc.*	Contexts include those that deal with personal, household, workplace, business, national and global finance, and more complex financial scenarios. *Examples of contexts in which national, global and more complex financial scenarios can be explored:* • *"Tax Pocket Guide" issued by SARS* • *buying a car or a house* • *student loan* • *pension fund or retirement annuity* • *funeral policy* • *inflation data and graphs* • *financial documents for provincial and national government* • *financial documents for a large business (sometimes shown in newspapers) etc.*
Tariff systems			
Income, expenditure, profit/loss, income- and-expenditure statements and budgets			
Cost price and selling price	----		
Break-even analysis	----		
Interest	Contexts are limited to those that deal with personal and/or household banking		
Banking, loans and investments			
Inflation	----		
Taxation	Contexts are limited to those that deal with VAT		
Exchange rates	----		

Question words to help you answer questions on the following page:

Question word	What is required of you
Analyse	Separate, examine and interpret
Calculate	This means a numerical answer is required –in general you should show your working, especially where two or more steps are involved
Classify	Group things based on common characteristics.
Compare	Point out or show both similarities and differences between things, concepts or phenomena
Define	Give a clear meaning
Describe	State in words (using diagrams where appropriate) the main points of a structure/process/phenomenon/ investigation
Determine	To calculate something, or to discover the answer by examining evidence.
Differentiate	Use differences to qualify categories.
Discuss	Consider all information and reach a conclusion.
Explain	Make clear; interpret and spell out.
Identify	Name the essential characteristics. PAY SPECIAL ATTENTION
Label	Identify on a diagram or drawing
List	Write a list of items, with no additional detail.
Mention	Refer to relevant points.
Name	Give the name(proper noun) of something.
State	Write down information without discussion.
Suggest	Offer an explanation or a solution.
Tabulate	Draw a table and Indicate the answers as direct pairs

SOME OF THE COMMON TERMS:

amortisation	The paying off of debt over a fixed period of time with fixed instalments
annual	Once every year. (E.g. Christmas is an annual holiday").
Balloon payment	An unusually large payment due at the end of a mortgage or loan
Bi- annual/ semi - annual	Twice a year
Per annum	For the entire year. (E.g. "You should pay R 100 per annum").
asset	Something having value, which can be sold to defray (get rid of) debts. Can refer to physical things such as houses, cars, etc.

ATM	Abbreviation: automatic teller machine.
Borrow vs Lend	To take something (e.g. Money) from someone with their permission for temporary use (borrow). Lend means the opposite: it means to give money to someone for temporary use. Remember: Borrow from, lend to. Can refer to financial transactions. If you take money from a bank, you are the borrower and the bank is the lender.
budget	To plan how to spend money; a plan of how to spend money; an estimate of the amount of money available.
Break Even	That point at which the income and expenses are the same.
cash	Printed or minted money, money not represented by cheques, cards, etc.
Calculate	This means a numerical answer is required – in general, you should show your working, especially where two or more steps are involved
cashier	Person who receives payment
credit	To lend someone money ; to have a certain amount of money that is not one's own that was lent to one . Credit limit: how much money you have borrowed or may borrow against
cheque	(n). A bill issued by banks, and filled in by the drawer (the person writing it), to represent an amount owed, usually with place to state who the amount is due to.
compound interest	(n). Interest charged on an amount due, but including interest charges to date. Compare to simple interest.
currency	A system of money in use in a particular country
debit	When someone or an organisation takes money out of your account. Compare to withdraw.
debt	The state of owing money.
deficit	Excess spending, or, the difference between the amount owed and the amount paid; shortfall; the excess of expenditure (spending) or liabilities (debts) over income (earnings) or assets.
Deposit .	Finance: to place money into an account.
EFT(Electronic Fund Transfer)	Electronic exchange or transfer of money from one account to another
exceed	Go beyond.
expenditure	How much money, time, or effort has been used on something.
Expense .	How much something costs in time, money, or effort.
fixed .	Not able to move, attached; or repaired, not broken.
Fixed Costs	Costs that stay the same
Gross Salary	A salary before any deductions have been made

Hire Purchase	A system where someone pays for an item in regular instalments while having use of it.
Income Tax	A stipulated amount, required by government, that must be paid by all businesses and individuals who earn a particular amount of money
inflation (n).	That prices increase over time; that the value of money decreases over time. General use: the action of getting bigger.
Initiation fee	A once off payment to set up a loan(may not exceed 15% of principal debt)
fund	A source of money ; to give money
insurance (n)	Finance: an agreement with an insurance company in which money is paid to guarantee against or compensate for future mishaps or losses. See premium. General use: something that is set up to prevent against future loss or mishap.
interest (n)	Finance: money paid regularly at a rate for the use or loan of money. It can be paid by a finance organisation or bank to you (in the case of savings), or it may be payable by you to a finance organisation on money you borrowed from the organisation. See compound interest and simple interest, see also borrow.
invest (v).	To put money into an organisation or bank (e.g. in buying shares) to gain interest on the amount at a higher rate. See interest.
invoice	A formal request for payment (in writing). It will usually state the name of the supplier or vendor (shop); the address of the shop or company that is requesting the amount; the VAT number of the shop; the words "Tax Invoice"; the shop's invoice number; the date and time of the sale; a description of the items or services bought; the amount of VAT charged (14%);the total amount payable.
liability	To owe, or to have something that causes one to be in debt; something that causes you to have to spend money; a legal or financial responsibility.
Mortgage (Bond)	A loan of money which you get from a bank in order to buy a house
Monthly	Once a month *(remember 12 months in a year)*
PAYE	Pay as you earn, tax taken off your earnings by your employer and sent to the South African Revenue Service before you are paid.
Profit	The income minus expenses
Profit Margin	The percentage of the income that is profit
rate	How often per second (or per any other time period). Finance: the exchange rate or value of one currency when exchanged for another currency; how many units of one currency it takes to buy a unit of another currency. Also "interest rate", or what percentage of a loan consists of interest charges or fees.
rebate	To send some money back to a person who has paid too much. An amount sent back to someone who has paid too much.
receipt	Finance: a piece of paper or other evidence sent to show that an amount was paid and that the person who received it (recipient) wishes to acknowledge (show) that they received (got) it.
refund	To send back a full payment made by someone who has paid incorrectly. See rebate.

Service fee	A fee incurred to cover administration costs
Simple interest	Interest charged on the original amount due only, resulting in the same fee every time.
tax	A compulsory levy imposed on citizens' earnings or purchases to fund the activities of government.
taxable	A service, purchase or item or earning that has a tax applied to it.
transaction	Finance: Exchanging money (payment or receipt); a credit and a debit.
transfer	To move from one place to another. Finance: usually refers to a payment or credit. See credit, debit, transaction.
statement	Finance: a summary of transactions (debits and credits, or payments and receipts) made on an account. See account, debit, credit.
UIF	Unemployment Insurance Fund. A government-run insurance fund which employers and employees contribute to, so that when employees are retrenched they can still collect some earnings.
VAT inclusive	When VAT has already been added to the item
VAT exclusive	When VAT still has to be calculated on a particular item
Variable costs	Costs dependent on the number of items produced or sold
withdraw	To remove. Finance: to take money out of an account that belongs to you. Compare debit.

CONTENT AND THE RESOURCES.

1. **Dealing with Finances:**

The following key concepts should be taken note of when dealing with this content area in Mathematical Literacy. (Page references: **Mind-the-gap")**

- Till Slips : Pages 41 to 43

- Account statements: Pages 44 to 45

- Bills (Municipality, Cell Phones): Pages 48 to 56

- Budgets, Income and expenditure statements: Pages 57 to 62

- Banking , Interests and tax: Pages 63 to 70

- Loans: Pages 71 to 72

- Inflation: Pages 73 to 74

- Payslips, deductions and tax: Pages 75 to 78

Ratio, Rate, Percentages and Proportion

From chief Markers report: The application of Ratio, Rates, Proportion and Fractions

in context is problematic.

Learner Note: Refer to Mind the Gap Pg: 10 – 15

Example:

Working with PERCENTAGES

A percentage decrease means the normal price decreases.
So the percentage is less than 100%.
Percentage increase means that the normal price increases
So the percentage is more than 100%

Example:
Tammy gets a 5% salary increase. Her new salary is R8 400 per month.
What was Tammy's salary before the increase?

Step 1

New salary = original salary + 5%
So 105% of original salary = R8400

So 5% of original salary = $\frac{8400}{105}$ = R80

Step 2

Original salary = R80 x
100 = R8000

Practice Questions

1   A bottle of cool drink contains 10% more than a normal bottle. This
    special bottle contains 660 ml. How much does the normal bottle
    contain?

2   Sibuslso saves 15% of his monthly salary. Each month he saves R950.
    What is his monthly salary?

3   Pretty gets a 18% salary increase. She now earns R114 000 per annum.
    What was his original salary?

4   A one-year old car is worth R165 000. This is a decrease of 16% of this
    value from when it was new. What was the price of the new car?

SOLUTIONS

1   600ml
2   R6333,33
3   R196428,57
4   R142241,38

Percentages in Finance

1   In February Jack wrote a test and scored 50%. In July he wrote another test and scored 66%. Liz wrote the same two tests and scored 40% and then 56%. Who improved the most?

2   During 2014 the rent on Susan's flat increased from R800 to R900 per week.
    a) Find the percentage increase in her rent.
    In the same period Susan's salary increased from R2 500 to R2 800.
    b) Find the percentage increase in her salary. Comment on your answer

3   The value of car A when new was R130 000. After 1 year its value was Rl12 000. The value of car B when new was R165 000 and after 1 year its value was R135 000. Calculate the percentage decrease in each car after 1year.

SOLUTIONS

1   They both improved their marks by 16%, but Liz improved the most (40%)
      Jack improved by 66%-56%= 16%.
       Liz improved by 56%-40%= 16%.
     % increase for Jack= (16%/56%) x100=28.57%.
      % increase for Liz= (16%/40%) x100=40%.

2   (a) 12,5%   (b) 12%
    Comment : % increase in rent more than % increase in salary

3   Car A: 13,8%   Car B: 18,2%

Ratios

From the Chief Markers Report: Interpreting fractional parts of answers in terms of the context

Learner Notes:

Make sure you know how to:

- use ratios to compare quantities.
- share in a given ratio.
- use ratios to set up a proportion.
- use steps to solving problems involving direct proportion.
- use steps to solving problems involving inverse proportion.

By the end of this unit you should be able to
- use your calculator to solve problems relating to ratio and proportion.
• how often we use ratio and proportion to solve real-life problems.

Example:
A father leaves his three children R80000 to be shared in a ratio 3:5:8. How much does each one receive?

Solution:
Total parts = 3+5+8= 16
Value of each part= $\frac{80000}{16} = 5000$
One that received 3 parts= 5000x3= R15000
One that received 5 parts= 5000x5= R25000
One that received 8 parts= 5000x8= R40000

Practice questions

1. James pays R6,40 for 4 cups of tea. How **much** will he pay for 56 cups

   of tea?

2. Jan pays **R1** 680 for 10 $m^{2'}$ of carpeting. How much would $12m^2$ of carpeting cost?

3. Three people can deliver 1000 brochures in 30 minutes. How long will it take 5 people to deliver 1000 brochures?

4. A farmer estimates it will take 12 workers 10 days to harvest his crop. How many workers are needed to harvest the crop in 8 days working at the same rate?

5. **It** costs R156 each for 7 people to hire a minibus. How much would each person pay if 12 people hired the same minibus?

6. Abdul can make 30 monthly payments of **R1**488 to repay a loan. How many payments are needed if she can pay R 1860 per month?

7. The lottery is won by 5 people and they each get **R1** 685240. How much would they each have received if only two people had won?

Solutions:

1. R8
2. R2016
3. 3,6 mins
4. 15 mins
5. R13
6. 24
7. R4 213 100

SIMPLE & COMPOUND INTEREST

From Chief Markers Report: Learners find it very challenging to calculate

the final amount of an investment manually

Learner Notes: Mind The Gap pg 68 – 70

Basic Example:

Simple Interest:

Example 1:
Calculate the total amount of interest paid when R30 000 is borrowed for 30 months at 15% interest per year.

What to note:
- Starting value is R30 000
- 30 months must be converted to years (2,5yrs)
- 15% can be written as 0,15 in your calculations
- **DO NOT USE THE FORMULA**

Solution:

Interest $= 30\ 000 \times 2,5 \times 0,15 = R11\ 250$

New Amount$= R30\ 000 + R11\ 250 = R41\ 250$

Example 2:
Thabiso was one of the lucky winners and won R 20 443,50 from LOTTO. She decided to invest R20 000 with bank that offered 4,5% p.a compounded annualy over a period of 24 month. Calculate the total amount she will receive after this period.

What to note:
- Only R 20 000 is invested (Starting value R20000)
- The interest rate is 4,5%
- Investment is compounded every year (Grows every year)
- It will grow for 24 months i.e. 2 years (increase twice)

Solution:

Year 1 Interest: $R20\ 000 \times 0{,}045 = R900$

End year 1: $R20\ 000 + R900 = R20\ 900$

Year 2 Interest: $R20\ 900 \times 0{,}045 = R940{,}50$

Final Amount: $R20\ 900 + R940{,}50 = R\ 30\ 840{,}50$

Exchange Rate

Chief Markers Report : Learners do not know when to divide and multiply
when converting.
Ratios are swopped around

Learner notes:

- Treat it as a ratio
- Make sure you compare the correct units with each other

- **WHAT IS AN EXCHANGE RATE?**

    * It is the value of one country's currency in terms of another country's currency.

- **WHAT DOES IT MEAN?**

    | Rand / $ | 7.32147 |

    This means $1
    $\therefore \$1 = R7.32147$

- **CALCULATIONS USING EXCHANGE RATES...**

    | Z / T | "rate" |

    | Find Z; T given then Z = T×"rate" | **or** | Find T; Z given then T = Z÷"rate" |

Examples:

1. | Rand / € | 9.32141 |

(a) How many **Rand** for € 20?

   | Find R, € given then R = €×"rate" |

   Amount (R) $= 20 \times 9.32141$
   $= 186.43$
   $\therefore €20 = R186,43$

2. | Rand / Yen | 0.0623 |

(a) How many **Rand** for 400 yen?

   | Find R, Yen given then R = Yen×"rate" |

   Amount (R) $= 400 \times 0.0623$
   $= 24.92$
   $\therefore 400\ \text{Yen} = R24,92$

- **CALCULATING THE EXCHANGE RATE...**

Examples:

Calculate the exchange rate between South Africa and Botswana (Rand / Pula) if you get 148.64 Pula for R175

Steps:	Answer:
1. Which currency equals "one"	Rand / Pula means Pula = 1
2. Write this currency on the left hand side	148.64 Pula = R175
3. Divide to get 1.	$(\div 148.64)$ $\therefore 1$ Pula $= R(175 \div 148.64)$ $= R1.17734$ Rand / Pula 1.17734
4. Write down the exchange rate	

(b) How many **Euros** for R150?

> Find €, R given
> then € = R ÷ "rate"

Amount (€) $= 150 \div 9.32141$

$= 16.09$

$\therefore$ R150 $=$ €16.09

(b) How many **Yen** for R60?

> Find Yen, R given
> then Yen = R ÷ "rate"

Amount (Yen) $= 60 \div 0.0623$

$= 963.08$

$\therefore$ R60 $= 963.08$ Yen

- **A "STRONG" vs A "WEAK" RAND...**

  * The lower the exchange rate
    - the less we pay for the other currency
    - the stronger the rand against the other currency

  * The higher the exchange rate
    - the more we pay for the other currency
    - the weaker the rand against the other currency

    For example:

    Rand / $ 6.5515   vs   Rand / $ 7.6485

    Lower exchange rate
    ($1 = R6.5515)
    ∴ We pay less for $1
    ∴ Rand is stronger

    Higher exchange rate
    ($1 = R7.6485)
    ∴ We pay more for $1
    ∴ Rand is weaker

- **TERMINOLOGY...**

  * "Firmed up"
    - means "to get stronger"
    - rate will be lower

Example:

The exchange rate on Monday was 7.0913 rand against the dollar. If the rand firmed up by $2,5c$ against the dollar, what was the exchange rate on Tuesday?

Answer:

Monday:
| Rand / $ 7.0913 |

Rand is firmer $\rightarrow$ Exchange rate lower
$\therefore$ substract $2,5c$ $(2,5c = R0.025)$
$\therefore$ $7.0913 - 0.025 = 7.0663$

Tuesday:
| Rand / $ 7.0663 |

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* "Weakened"
  - means to get weaker
  - rate will be higher

Example:

Yesterday the rand-pound exchange rate was 13.7191. If the rand $7c$ weaker against the pound today, what is the exchange rate?

Answer:

Yesterday:
| Rand / £ 13.7891 |

Rand is weaker $\rightarrow$ Exchange rate is higher
$\therefore$ add $7c$ $(7c = R0.07)$
$\therefore$ $13.7191 + 0.07 = 13.7891$

Today:
| Rand / £ 13.7891 |

IMPORT OR EXPORT?

* A strong rand makes overseas goods cheaper for us to buy
  $\therefore$ A strong rand is good for import

Example:

Importing goods valued at € 1200.

| Rand / € 9.2180 | vs | Rand / € 10.0121 |

Amount (R) $= 1200 \times 9.2180$ Amount (R) $= 1200 \times 10.0121$
$\qquad\qquad = R11061,60$ $\qquad\qquad = R12014,52$

Rand stronger;
Goods cheaper in Rand
$\therefore$ Good for import!

* A weak rand makes our goods cheaper to buy overseas.
  $\therefore$ A weak rand is good for export

Example:

Exporting goods valued at R25 000

Rand / €   9.2180   vs   Rand / €   10.0121

Amount (€) = 25000 ÷ 9.2180   Amount (€) = 25000 ÷ 10.0121
        = € 2712.09   = € 2496.98

Rand weaker;
Goods cheaper in euro
∴ Good for export!

INTERPRETING GRAPHS…

*   Highest and lowest points

Rand – Pound Exchange Rate:

Rate highest
Rand weakest
Good for export

Rate lowest
Rand strongest
Good for import

(C)2006 x–rates.com

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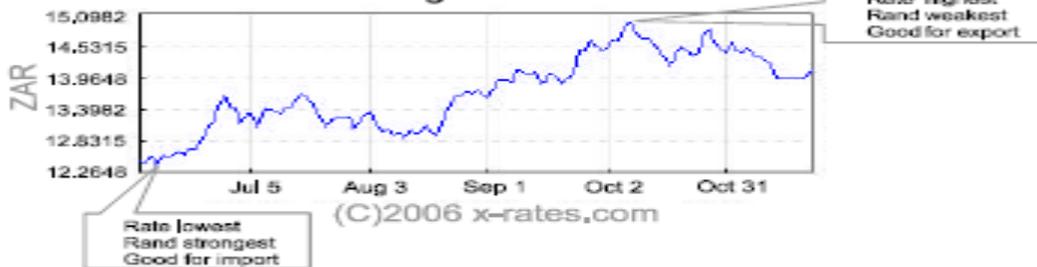
1.   **A:** Rand/EGP 1.28689   **B:** Rand/EGP 1.3481

(EGP = Egyptian Pounds)

Which of the above exchanges rates…

(a)   indicates a higher rate?   (b)   indicates a stronger rand?
(c)   will be better for importing goods?

2.   Indicate on the graph where…

(a)   the rand was the strongest.
(b)   the rand was the weakest.
(c)   it would have been a good time to export goods.
(d)   it would have been a good time to import goods

Rand – Australian Dollar Exchange Rate:

(C)2006 x-rates.com
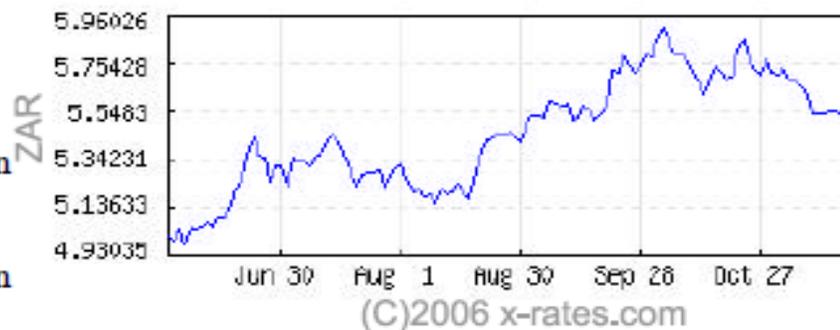
3.   Use the graph above and estimate…

(a)   the date when the rand was at its weakest.
(b)   the exchange rate on the 1st of August.
(c)   the best day for importing goods.

Solution:

1a) 1.3481 b) 1.28689 c) 1.28689	2 on the graph 1. a) approx 30 September (appox +- 2 days) b) R5,34 c) approx 1 June

Inflation

Chief Markers Report:

- **Learners do not understand impact of inflation on everyday resources**
- **Learners cannot draw conclusions or identify trends from calculations or graphs.**

Learner Notes:Mind the Gap Pg73-75

- **INFLATION...**

  * Inflation rate is the annual percentage change in the cost of goods.

  * The more expensive things become, the higher the inflation rate.

  * Inflation rate can be calculated using this basic formula.

  $$\text{Inflation rate} = \frac{\text{Final amount} - \text{Starting amount}}{\text{Starting amount}} \times \frac{100}{1}$$

  Example: Calculate the inflation rate if a trolley of groceries cost R132,80 in 2004 and R128,00 in 2005.

  Answer: $\text{Inflation rate} = \frac{\text{Final amount} - \text{Starting amount}}{\text{Starting amount}} \times \frac{100}{1}$

  $$= \frac{R218,00 - R123,80}{R123,80} \times \frac{100}{1}$$

  $$= 3,4\%$$

- **CPI...**

  * CPI stands for Consumer Price Index

  * The CPI is calculated by comparing the price of an identical basket or trolley of goods every month.

  * The year-on-year inflation rate is calculated by comparing the CPI of the current month with the CPI of the same month in the previous year.

  $$\text{Inflation rate} = \frac{\text{Current month's CPI} - \text{Previous year's CPI (same month)}}{\text{Previous year's CPI (same month)}} \times \frac{100}{1}$$

  Example: Calculate the year-on-year inflation rate if the CPI for February 2002 was 110,2 and the CPI for February 2001 was 104,1.

  Answer: $\text{Inflation rate} = \frac{2002 \text{ CPI (Feb)} - 2002 \text{ CPI (Feb)}}{2002 \text{ CPI (Feb)}} \times \frac{100}{1}$

  $$= \frac{110,2 - 104,1}{104,1} \times \frac{100}{1}$$

  $$= 5,9\%$$

- **INFLATION GRAPHS…**

  * If the graph is increasing, the trend line is drawn by connecting the two points on the graph so that the line runs along the **bottom** of the graph without cutting the graph.
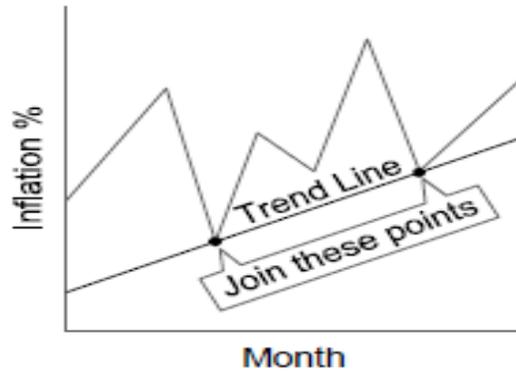
Example:


  * If the graph is decreasing, the trend line is drawn by connecting the two points on the graph so that the line runs along the **top** of the graph without cutting the graph

Example:
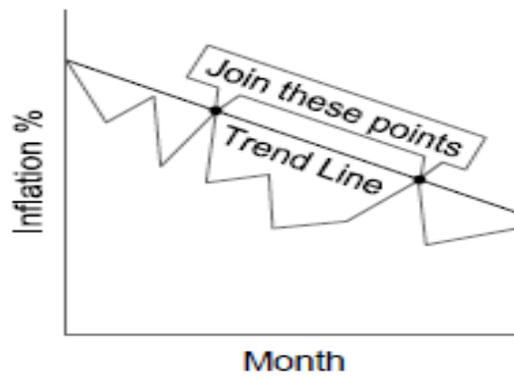
- **INFLATION'S EFFECT ON PRICES AND SALARIES…**

  * To increase prices and salaries by the inflation rate use the following formula:
    New Salary = Old Salary × (1 + Inflation rate)

    or

    New Price = Old Price × (1 + Inflation rate)

  * To find the old price or old salary **divide** instead of multiply:
    Old Salary = New Salary ÷ (1 + Inflation rate)

    or

    Old Price = New Price ÷ (1 + Inflation rate)

Example: Andrew's current salary is R48 000. It was increased by 6,7% which was the inflation rate. What was his salary before the increase?

Answer: Old Salary = New Salary ÷ (1 + Inflation rate).
    = R48 000 ÷ (1 + 6,7%)
    = R48 000 ÷ 1,067
   = R44 986

1. A trolley full of groceries cost R49,00 in 1991. If the same trolley cost R55,70 in 1992, what was the inflation rate?

2. The following table shows the year-on-year inflation rate for the first half of 1992.

Month	January	February	March	April	May	June
1991 CPI	45,7	46,3	46,7	47,4	48,1	48,4
1992 CPI	53,1	53,6	54,0	54,7	55,1	55,7
Inflation rate (%)	16,2	(a)	(b)	15,4	(c)	(d)

Work out the missing values (a) to (d).

1.4 Stats SA has released data showing that the average price of a 80-gram slab of chocolate has risen by 39% from May 2014 to May 2016. The graph below shows indexes used to compare the average of a 80-gram slab of chocolate with the average prices for cake and ice cream. The average index price, as at May 2014, was taken as 100%.

GRAPH: THE AVERAGE INDEX PRICES (AS A PERCENTAGE) FOR ICE CREAM, CAKE AND CHOCOLATE FROM MAY 2014 TO MAY 2016

[Adapted from Stats SA data]
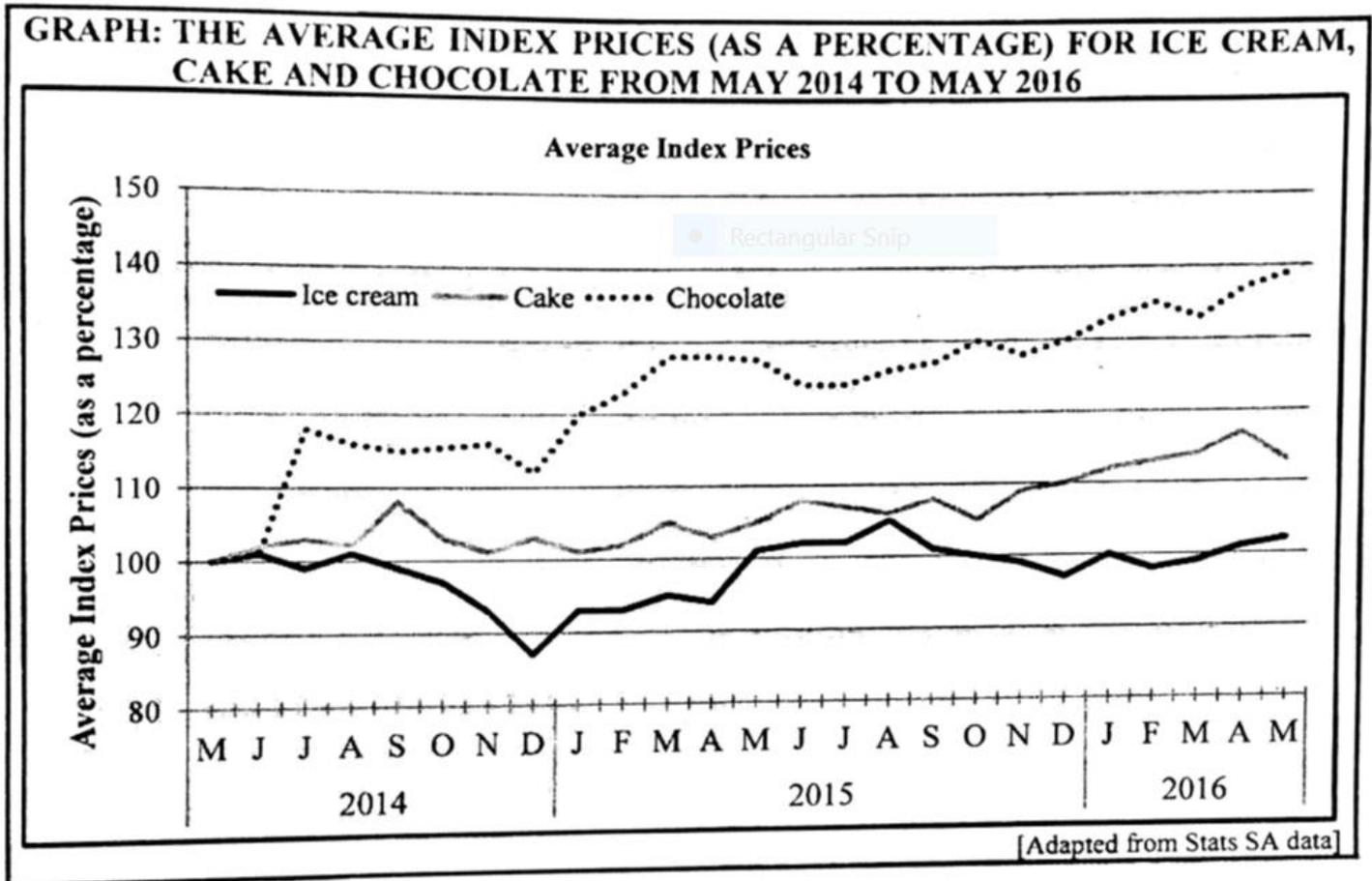
Study the graph above to answer the questions that follow:

1.4.1 Give the date when the average index price for chocolate was 120%   (2)

1.4.2 Describe the change in the average price of cake from April 2016 to May 2016   (2)

1.4.3 Write down the average index price for ice cream for October 2015.   (2)

Value Added Tax (VAT)

Chief Markers Report: Learners have a challenge in identifying the difference VAT inclusive and VAT exclusive and the processes involved in the calculations.

Learner Notes: Mind the Gap pg 77

Working with VAT

All prices that we see in shops include VAT (Value Added Tax). You need to calculate VAT when:

- you are selling something and have to add VAT to the price
- you want to check an invoice and make sure that the correct amount of VAT is included
- VAT-inclusive: means that 14% VAT has already been added to the price
- VAT-exclusive price + amount of VAT = the price including VAT.
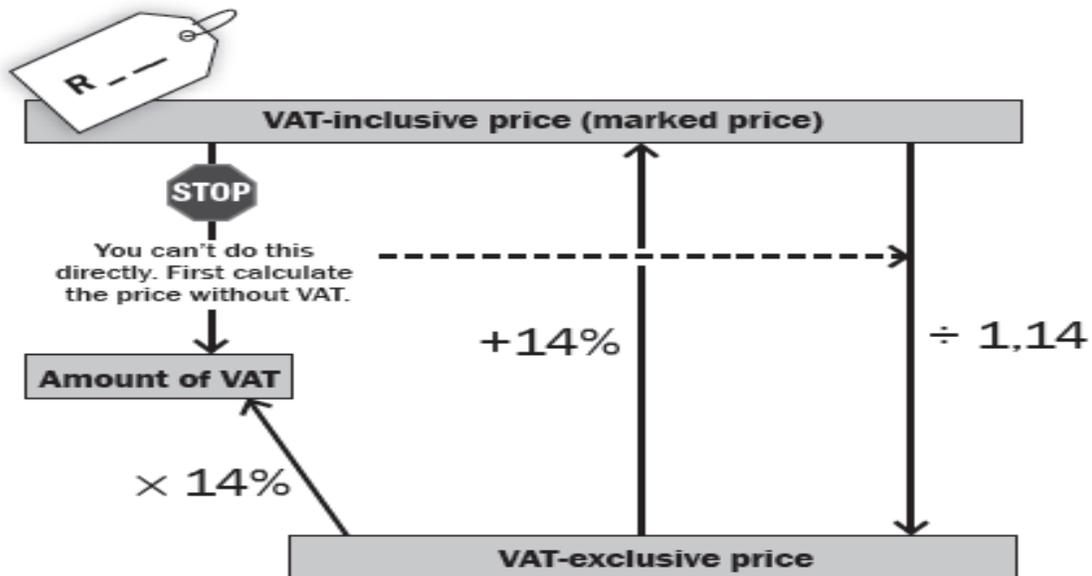
1.1 In South Africa, the value-added tax (VAT) is charged on some items. It is calculated as 14% of the cost price. Some prices include VAT, while others exclude it. It is only added when one pays at the till point. Consider the prices of items that appear in the accompanying table and calculate the missing values. (5)

Item	Price (excluding VAT)	Price (including VAT)
Flour	R 69.56	...
Sugar	...	R 48.00

Solution: Including VAT = R48.00

$$\text{Excluding VAT} = \frac{48}{1,14} = R42,11$$

Excluding VAT = R69.56

$$\text{Including VAT} = R69,56 \times 1.14 = R79,30$$

Income Tax

Chief Markers Report: Learners find it to work out the tax payable if

steps are not given

Learner Notes: Mind The Gap pg 75-78

- **TERMS THAT YOU MUST KNOW…**

  * **SARS** is the South African Revenue Service and they are responsible for collecting tax for the government.
  * **Income tax** is money paid to **SARS** based on an individual's personal income.
  * A **tax rebate** is money that the government pays back to you for paying your taxes.
  * The **tax threshold** is the maximum income one can earn without paying tax.
  * A **tax bracket** is the income interval into which ones income falls.

- **TO WORK OUT INCOME TAX…**

  * Total Tax Paid to **SARS**:

    Step 1: Find applicable tax bracket in tax table.
    Step 2: Write down the formula of the tax rate that corresponds to the tax bracket.
    Step 3: Substitute the applicable values into the formula and calculate the "**tax payable**"

2

Mr Piedt earns an annual taxable income of R542 096,76.

TABLE 1 below is a tax table that shows how much personal income tax he needs to pay.

TABLE 1: INCOME TAX RATES FOR INDIVIDUALS
2017 TAX YEAR (1 MARCH 2016–28 FEBRUARY 2017)

TAX BRACKET	TAXABLE INCOME (R)	TAX RATES (R)
1	0–188 000	18% of taxable income
2	188 001–293 600	33 840 + 26% of taxable income above 188 000
3	293 601–406 400	61 296 + 31% of taxable income above 293 600
4	406 401–550 100	96 264 + 36% of taxable income above 406 400
5	550 101–701 300	147 996 + 39% of taxable income above 550 100
6	701 301 and above	206 964 + 41% of taxable income above 701 300

Adapted from www.SARS.gov.za

1.2.1	What does the acronym *SARS* stand for?	(2)
1.2.2	Write down the minimum amount of tax payable for tax bracket 3.	(2)
1.2.3	Calculate Mr Piedt's average monthly taxable income.	(2)
1.2.4	Identify the tax bracket applicable to Mr Piedt's taxable income.	(2)

Banking:

Chief Markers report: Learners cannot interpret balances especially when negative

values are involved(interpretation of debit and credit)

Also the issue of the effect of bank charges when smaller values are used.

Learner Notes: Mind the Gap:63 - 68

QUESTION 2 (A QUESTION ON BANK STATEMENT)

The following questions are based on Dumisani's bank statement shown below. He has a savings account that pays 4% per annum compounded monthly. This means that interest is calculated and added on every month.

Statement number:	000 456	Mr D. Nkozi
Statement date:	Monthly	5 Ridge Road
Account number:	43 109 984	Rondebosch, 7700

Date	Details	Debit	Credit	Service fee	Balance	
02/01/08	Brought forward				4 229,58	
03/01/08	Cash	3 000,00		6,80	1 222,78	
06/01/08	EFTP	275,80		1,80	?	
08/01/08	TELJOY 237 809	198,62		4,90	741,66	
09/01/08	EDGARS 347 820 998	248,57		4,90	488,19	
17/01/08	Cash	500,00		1,80	13,61	OD
21/01/08	Deposit – Mr Jones		1 000,00		986,39	
28/01/08	Salary		5 000,00		5 986,39	
29/01/08	Cash	100,00		1,00	5 885,39	
01/02/08	Interest		?		?	

2.1 Explain the difference between the debit and credit columns. (2)

2.2 Dumisani had to draw money to pay his rent early in the month. How much is his rent? (Assume that he drew exactly what he needed to pay.) (2)

2.3 What do the letters 'OD' next to a balance mean? (2)

2.4 How much in total did Dumisani pay for bank fees during the month?
(2)

2.5 Calculate the balance on 6 January.
(2)

2.6 Is Dumisani better off or worse off at the end of the month? Give a reason for your answer. (2)

2.7 How much money in total was paid into Dumisani's account during January?

(2)

When your money is held by a bank, the bank is able to lend or invest this money at a profit. In return for the use of your money, the bank will pay you interest.

2.8 If interest is 6% p.a. (per annum means for the whole year), then what percentage is added to our account each month? (2)

2.9 Interest is paid on the 1st of each month for the previous month and is calculated on the end of month balance. Calculate how much interest will be paid on 1 February. (2)

2.10 Calculate the bank balance at the end of the day on 1 February. (2)

2.11 How much interest was paid last month? (Hint: let last month's balance = x.)

(4)

[24]

Tariffs

Chief Markers Report: Learners have problems reading tables and analysing data from them.

- Also learners struggle to draw conclusions from the information

Learner Notes: Make sure you look at whether the sign is greater than smaller than or greater and equal to/ smaller and equal to

- Check the units you are working in
- Check for the time frame used
- Check whether prices include VAT or not

Teacher Note: CAPS see list of documents to be covered

Financial Documents Pg 40 (listed find only FEW examples):

- Relating to households bills e.g electricity, water, telephone
- Shopping e.g till slips, account statements
- Banking e.g bank statement

Tariff System Pg 50

- Municipal documents; telephone bills; cellphone;fixed lines;

Transport tariffs

1.2

Mahlako spent R100 on electricity for the month of August 2013. The electricity tariffs in the municipality area where she lives are provided in the table below. Study the tariff table to answer the questions that follow:

Eskom electricity purchase blocks (1 April 2014 to 31 March 2014)	Price (cent/kWh)* *All prices include VAT
Block 1: ≤ 50kWh	78.65
Block 2: (50 - 350kWh)	93.80
Block 3: (350 - 600kWh)	130.12
Block 4: >600kWh	148.82

1.2.1   Calculate the rate (in rands) that Mahlako paid for the first 50kWh she has used in August.   (2)

1.2.2   Determine the total amount that Mahlako paid for the first 50kWh she has used in August.   (2)

1.2.3   Calculate the Value Added Tax that Mahlako paid on the first 50kWh of electricity she used in August. NOTE: VAT is calculated as 14% of the cost price   (3)

1.2.4   Calculate the rate (in rands) that Mahlako paid for the second 50kWh of electricity she has used in August.   (2)

1.2.5   Recall that Mahlako spent R100 in total for electricity in August

Determine the total kilowatt-hour of electricity she has used in August.

Example of the New Format of Question 1

QUESTION 1: DBE SCE JUNE 2017(N.B LEVEL 1 IN QUESTION 1 IN PAPER 1)

QUESTION 1

1.1

Tyrone buys chocolates in bulk to make gift baskets containing different chocolate bars to sell. He buys boxes that contain bars of Peppermint Crisp, Bar-One, Kit Kat and Cadbury 80 g chocolate slabs.

Picture of a gift basket with chocolate bars

1.1.1   Determine the total price of a box with Peppermint Crisp bars if there are 40 bars in a box and the unit price of a bar is R8,70.   (2)

1.1.2   Explain the term *profit*.   (2)

1.1.3   A box with Kit Kat bars costs R435,04. To determine the selling price, Tyrone increases the cost price by 40%. Determine the amount that he adds to the cost price.   (2)

1.1.4   Tyrone makes a gift basket containing the following items:

ITEMS	UNIT COST PRICE
Bar-One	R10,04
Peppermint Crisp	R8,70
Kit Kat	R20,66
Cadbury 80 g chocolate slab	R6,73
Empty basket	R29,99

(a)   Determine the total cost price of the gift basket.   (3)

(b)   He sells 230 of these gift baskets and receives a total income of R22 770.

Determine the selling price of each gift basket.   (2)

QUESTION 1(EC September Trial Paper 2017)

1.1   Ben buys a bicycle on lay-bye for R3 200. He pays a deposit of R750 and afterwards chose to pay R300 monthly to cover the balance.

1.1.1 Express the deposit as a percentage of the purchase price. (2)

1.1.2 Determine the balance, after the deposit has been paid. (2)

1.1.3 Determine the total amount paid after the deposit and five instalments has been paid. (2)

1.2   Karen bought 50 Kwh of electricity from her municipality in June 2017 when the tariff was 0,8865 R/Kwh (Rand per kilo-watt hour), including VAT.

1.2.1 Calculate the rate (in cents) for the tariffs charged for the 50 Kwh of electricity. (2)

1.2.2 Calculate the total amount charged for the 50 Kwh of electricity. (2)

1.2.3 Write the abbreviation VAT out in full. (2)

1.3 A care-taker at a school is paid at the rate of R26 per hour worked. He works from

7:30 am for 7 hours, excluding a 15-minute tea break and 45-minute lunch break.

He does not work during weekends.

1.3.1 Determine the time when he goes off duty. (2)

1.3.2 Calculate his income if he worked for four weeks. (2)

1.4 The distances between the cities in South Africa are shown in ANNEXURE A. Use

it to answer the following questions.

1.4.1 Write down the distance between Mafikeng and Port Elizabeth. (2)

1.4.2 Name TWO cities that are equal distance from Kimberley. (2)

1.4.3 Which two cities are furthest apart? (2)

1.5 A research was carried out among some parents of Zozo High School to indicate the

percentage of their income they saved in June 2017. The results are shown on the

graph below.

1.5.1 Determine the number of people that took part in the survey. (2)

1.5.2 Calculate the number of people who saved less than 20% of their income. (2)

1.5.3 What was the modal range? (2)

1.5.4 Write down the type of graph used to display the information. (2)

[30]

ACTIVITY 1: EC JUNE 2017 MLIT P1 COMMON EXAMINATIONS:
 QUESTION 1

1.1   Mabo is a director in an import company and earns R1 285 456 p.a.

        1.1.1   Write down the abbreviation p.a in full. (2)

        1.1.2   Write R1 285 456 in words. (2)

        1.1.3   Round off R 1 285 456 to the nearest hundred. (2)

1.2   Study the table 1 below that shows the items Mabo bought from a Super Spar in Port Elizabeth and answer the questions that follow: (Some information is omitted)

TABLE 1 : Items Mabo bought

Item	Prices excluding VAT
1: Marina Salt 500g	R 3,99
2: Maize meal 2,5 Kg	R 29,99*
3: I&J Fish Fingers 400g	R 59,98
4: Jumbo eggs (1 dozen)	R 17,99
5: 150 ml of cooking Oil	R 13,99
*0,00% VAT Rate	
14% VAT Rate	

1.2   1.2.1   Calculate the price of one egg. (2)

        1.2.2   Calculate the amount of VAT to be charged on I & J Fish Fingers 400g. (2)

        1.2.3   Convert 2,5 Kg of Maize meal into grams. (1000g = 1Kg) (2)

        1.2.4   Calculate the number of grams for a $150\,ml$ cooking oil if $10\,ml$ weighs 8g. (2)

1.3   Jane mixed orange juice with water in ratio 1: 5 to serve parents at a school function.

                Determine the number of glasses of water used to mix 10 glasses of orange juice. (2)

1.4   The programme for a 2017 matric farewell function was designed on an A 4 sheet of paper with length of 0.294 m. Give this length in centimetres (cm). Given that 1cm = 0.01m (2)

ACTIVITY 2 (Feb/March 2016)

QUESTION 1

1.1

In recent years households in South Africa have experienced a large increase in electricity costs. Mr Chan would like to replace his electric stove with a gas stove. He received quotations from The Alternative Heat Company (Option 1) and TG Gas Stove Specialist (Option 2), as shown in ANNEXURE A. Some information has been omitted.

Use ANNEXURE A to answer the questions that follow.

1.1.1   Calculate the total quotation amount for Option 1.   (5)

1.1.2   Mr Chan estimates that the difference in total cost between the two options is less than R1 000,00.

       Verify, showing ALL calculations, whether Mr Chan's estimation is valid.   (5)

1.1.3   Give ONE reason why Mr Chan may choose the more expensive option.   (2)

1.2

A certified gas dealer who is 48 years old earned a taxable income of R0,742 million during the 2014/2015 tax year and contributed to a registered medical aid scheme for herself and four dependants. She projected that her taxable income would remain the same during the 2015/2016 tax year.

Study the tax table and the medical aid credits in ANNEXURE B to answer the questions that follow.

1.2.1   Explain the impact of the tax rebate and the medical aid credits on the tax payable.   (4)

1.2.2   The dealer calculated that her annual tax due to SARS (South African Revenue Service) would increase by only R150,00 from the 2014/2015 tax year to the 2015/2016 tax year.

   Verify, showing ALL calculations, whether her calculation is valid.   (8)

1

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ANNEXURE A

QUESTION 1.1.1 TO QUESTION 1.1.3

OPTION 1

QUOTATION				
The Alternative Heat Company 375 Nelson Drive Upington 1826		DATE		23/04/2015
		INVOICE NUMBER		# 1431 B
		CUSTOMER ID		Won 283
Issued to: Mr RS Chan 23 ThirdAvenue Upington				
DESCRIPTION	**QUANTITY**	**PRICE EXCLUDING 14% VAT**		**AMOUNT IN RAND**
Defy DHG 121 gas stove	1	R2 893,86		R2 893,86
Empty 9 kg gas bottle	1	R394,74		R394,74
Refill 9 kg gas bottle	9 kg	R20,00 (per kg)		...
Internal installation (parts and gas certificate included)	1	R2 719,30		R2 719,30
Gas piping	2 m	R15,35 per metre		...
		SUBTOTAL		...
		14% VAT		...
		TOTAL AMOUNT		...
THIS QUOTATION IS VALID FOR 14 DAYS FROM THE ISSUE DATE.				

OPTION 2

TG Gas Stove Specialist
37 Rooiness Street, Upington, 1826
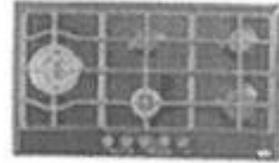
Quote : # 1416   **Date:** 25/04/2015
Issued to: RS Chan
Mr
23 Third Avenue
Upington

ITEM DESCRIPTION	MEASUREMENTS	PRICE INCL. 14% VAT
Five-plate stove, each	900 mm	R3 499,00
Gas bottle cylinder, each	9 kg	R499,00
Refill 9 kg gas bottle cylinder, each	per 9 kg	R189,00
Hose and regulator set		R235,00
4 metal clips @ R3,50 each		...
Copper pipe @ R23,50/m	2 m	...
Installation by certified gas technician @ R350,00 per hour		...
Gas certificate		R349,00
Total Cost (including VAT)		...

NOTE: Installation of gas stove takes three hours.

[Source: www.vertex42.com]

ANNEXURE B

QUESTION 1.2

TABLE 1: SARS tax rates plus medical aid credits for two tax years ending 29 February 2016 and 28 February 2015

Statutory rates for personal income tax for individuals:

YEAR OF ASSESSMENT ENDING 29 FEBRUARY 2016

TAXABLE ANNUAL INCOME (R)	RATES OF TAX (R)
0–181 900	18% of taxable income
181 901–284 100	32 742 + 26% of taxable income above 181 900
284 101–393 200	59 314 + 31% of taxable income above 284 100
393 201–550 100	93 135 + 36% of taxable income above 393 200
550 101–701 300	149 619 + 39% of taxable income above 550 100
701 301 and above	208 587 + 41% of taxable income above 701 300

YEAR OF ASSESSMENT ENDING 28 FEBRUARY 2015

TAXABLE ANNUAL INCOME (R)	RATES OF TAX (R)
0–174 550	18% of taxable income
174 551–272 700	31 419 + 25% of taxable income above 174 550
272 701–377 450	55 957 + 30% of taxable income above 272 700
377 451–528 800	87 382 + 35% of taxable income above 377 450
528 001–673 100	140 074 + 38% of taxable income above 528 000
673 001 and above	195 212 + 40% of taxable income above 673 100

TAX REBATES

	2016	2015
Primary rebate	R13 257	R12 726
Secondary rebate (for persons 65 years and older) in addition to primary rebate	R7 407	R7 110
Tertiary rebate (for persons 75 years and older) in addition to primary and secondary rebate	R2 466	R2 367

MEDICAL AID CREDITS IN RESPECT OF MONTHLY MEDICAL AID CONTRIBUTIONS

	2016	2015
Tax payer only	R270	R257
First dependant	R270	R257
Additional dependants	R181 each	R172 each

[Adapted from www.bdo.co.za]

QUESTION 2

2.1

From 1 July 2014 to 28 July 2014 workers in the metal and engineering industry went on strike, demanding a 15% increase in wages as from 1 July 2014. Employers applied the no work, no pay principle.

TABLE 2 below shows the monthly gross wage offer before the strike and the final wage settlement for two wage rates, A and H.

TABLE 2: Wage offers before the strike and the final, improved offers for two wage rates

GROSS MONTHLY WAGE JUNE 2014		GROSS MONTHLY WAGE DUE TO STRIKE	
WAGE A	WAGE H	WAGE A	WAGE H
R11 000	R6 000	...	...

	EMPLOYER'S OFFER BEFORE STRIKE (PERCENTAGE INCREASE)		IMPROVED WAGE OFFER DUE TO STRIKE (PERCENTAGE INCREASE)	
July 2014	7,0%	8,0%	8,0%	10,0%
July 2015	CPI	CPI + 1%	7,5%	10,0%
July 2016	CPI	CPI + 1%	7,0%	10,0%

[Source: www.solidariteit.co.za]

For the purposes of comparison, the consumer price index (CPI) of 6,5% for both 2015 and 2016 will be used.

Daily wage rate = Monthly wage × 12 ÷ 365

2.1.1 It was calculated that a worker on Wage Rate A lost a total of R10 834,85 in wages during the strike.

(a) Show, with calculations, how this loss was calculated. (6)

(b) Hence, state ONE other negative financial implication of a prolonged strike for a worker. (2)

2.1.2 Verify, showing ALL calculations, whether a worker on Wage Rate H would be able to make up the loss of income (due to the no work, no pay principle) by the end of June 2015, using the improved wage offer, without working overtime or having an extra job. (6)

NSC November 2017 Paper 2

QUESTION 1

1.1

> ANNEXURE A shows a summary of the Income and Expenditure statement with notes of the South African National Blood Service[SANBS] for the financial year ended 31 March 2016.Some of the amounts have been omitted.

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

1.1.1 Communication costs decreased by 4,402% from 2015 to 2016.

Calculate (to the nearest thousand rand) the communication costs

for 2016. (4)

1.1.2 The SANBS imports 75% of its product testing material and consumables. Explain what possible impact a weakening of the rand will have on their total. Profit for the year.

1.1.3 Compare ,showing all calculations , the 2015 and 2016 percentage profit for the SANBS.

You may use the following *formula:*

$$\textbf{\textit{Annual Profit}} = \frac{\textbf{Annual Total Profit}}{\textbf{Total Annual Primary Income}} \times \textbf{100\%}$$

One of the SANBS directors, who is 68 years old, earned a taxable Income of R663 000 during the *2016/2017* tax year.

Calculate the *total* income tax this director has to pay on his annual taxable income (ignore medical aid credits).   (6)

1.3   During 2016, a total of 110 000 South Africans in the age group
        16 to 19 years donated blood. The SANBS decided to appeal to
        eligible high-school learners to donate blood. Their target is to
        increase the number of donors in this age   group by an annual
        growth rate of 9,6%, compounded over the next two years.

Calculate, showing ALL calculations, the targeted number of blood donors in this age group for 2018.
                                  (4)

ANNEXURE A

SUMMARY OF INCOME STATEMENT AND EXPENDITURE STATEMENT FOR THE YEAR ENDED 31 MARCH 2016

	Notes	2016 R'00	2015 R'000
Primary income	I	2403	2250041
Other income		1209	86609
Primary expenses	2	(216	(1
Other expenses: Interest paid		(202)	(172)
Total annual profit		**3606**	**342534**

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

	2016 R'000	2015 R'000
1. Primary income		
Service fees	…	2249081
Product sales	…	960
Total annual primary income	**2403509**	**2250041**
2. **Primary expenses**		
Advertising and promotions	(67257)	(56401)
Communication costs	…	(32 187)
Consumables	(640601)	(582
Depreciation	(69866)	(64748)
Employee benefits	(953 592)	(888
Freiaht	(135 768)	(125736
Rent	(34087)	(30115)
Product testing	(55 267)	(54252)
Other expenses - Includes bad debts written off, computer costs, foreign exchange variance, insurance, repairs and maintenance	(176363)	(158
Total annual primary expenses	**(2163571)**	**(1**

[Adapted from 2016 SANBS Annual Report]
NOTE: Brackets ( ) indicate deduction.

Annexure

Question 1.2

TABLE 1: INDIVIDUAL TAX RATES FOR THE *2016/2017* TAX YEAR

ANNEXURE TAXABLE ANNUAL INCOME	RATES OF TAX
R0-R188 000	18% of eachR1
R188 001-R293 600	R3 3 840 + 26% of the amount above R 188 000
R293 601-R406 400	R61 296 + 31 % of the amount above R284 100
R406 401-R550 100	R96264 + 36% of the amount above R406 400
R550 101-R701 300	RI47996 + 39% of the amount aboveR550 100
R701 301 and above	R206 964 + 41 % of the amount above R 701 300

TAX REBATES	
Primary rebate	R13 500
Secondary rebate (for persons 65 years and older)"	R7407
Tertiary rebate (for persons 75 years and older)	R2 466

[Source: *SARS pocket guide,* 201612017]

B. DATA HANDLING

The diagram shows a cycle: Pose a question ↔ Collect data ↔ Organise data ↔ Summarise data ↔ Graph data ↔ back to Pose a question, with Analyse data in the centre connected to all steps.

Section	Grade 10	Grade 11	Grade 12

Developing questions	In Grade 10, the type of data dealt with is limited primarily (but not exclusively) to data including:
	
	• single sets of data containing multiple categories (*e.g. working with different test scores categorised into mark categories for an entire class, but not sorted according to gender*)
	
	• values that can be read directly from graphs and/or tables without the need for estimation
	
	• data relating to the personal lives of learners and/or to issues that are familiar to the learners, e.g.:
	  - test and exam results
	  - school sports results
	  - height and weight data of learners in a class
	  - school statistics (e.g. number of learners in each grade; number of male and female learners)
	  - data about the type and amount of litter in a school
	  - data about electricity consumption of various appliances in a household
	  - data on telephone call time and duration
	  - pocket money data.
		In Grade 11, the type of data dealt with is limited primarily (but not exclusively) to data including:
		
		• two sets of data containing multiple categories (*e.g. working with different test scores categorised into mark categories and organised according to gender*)
		
		• values that can be read directly from graphs and/or tables without the need for estimation
		
		• data relating to the wider community and more complex social issues that are less familiar to learners, e.g.:
		  - sports results/statistics for provincial and/or national sports events
		  - sales figures for a business
		  - profile of shoppers at a shopping centre
		  - vehicle statistics (as an indication of income level) of shoppers at a shopping centre
		  - price history data for grocery items
		  - data on housing, toilet, water and electricity facilities for a small community
		  - data on employment rates for a small community
			In Grade 12, the type of data dealt with is limited primarily (but not exclusively) to data including:
			
			• multiple sets of data containing multiple categories (*e.g. working with vehicle statistics containing information on the number of different types of unroadworthy vehicles in each province in South Africa*)
			
			• complex values (that is, values expressed in millions or large data values containing complex decimal values) for which estimation may be necessary to determine values on graphs and in tables
			
			• data relating to national and global issues, e.g.:
			  - national and/or provincial health statistics (sourced from the Department of Health)
			  - national and/or provincial education statistics (sourced from the Department of Education)
			  - national and/or provincial road accident statistics (sourced from Arrive Alive campaign)
			  - national and/or provincial population statistics (sourced from Statistics South Africa)
			  - historical inflation and/or exchange rate data (sourced from Statistics South Africa)

Topic: Data handling — Grades 10, 11 and 12. Type and scope of data per grade. Sections: Collecting data, Classifying and organising data, Summarising data, Representing data, Analysing data.

TERMINOLOGY (Glossary)

- **Population** :The group that we want to collect data from.
- **Sample**: A small selection of a larger population or collection.
- **Biased Sample**: Occurs when a certain section of the population from which the sample is drawn is not representative of that population.
- **Unbiased Sample** :When the population has the same chance of being selected.[Random Sampling]
- **Mean**: Sum of the given items divided by the total number of entries. Most likely value that you can get from the sample space.
- **Median**: The middle number in an arranged set of data.(odd numbered and even numbered data)
- Range: The difference between the highest and the lowest value in a data set.
- **Mode**: The most appearing value in a data set. Data item which occurs most frequently. (bi-modal and tri-modal)
- **Trend**: A tendency or general direction in which something changes over time.
- **Quartiles**: The values which divide an arranged set of data into 4 quarters.
- **Percentiles**: A division of percentages into subsections.
- **Discrete** data: The data values are whole number values or fixed numbers.
- **Continuous** data: Data values can be any number values in a range.
- **Categorical** data: Groups the data into distinct sets, also known as qualitative data.
- **Numerical** data: Consists of numbers and divided into discrete and continuous data; also known as quantitative data.
- **Tally:** A system of using short lines, where each line (or tally) represents one response to a certain question.
- **Frequency table**: Representing data using tally marks to record the number of times an item occurs.
- **Grouped data:** Data values which are grouped in intervals.
- **Ungrouped data:** Data values which are not grouped in any way.
- **Pictogram:** A graphical representation of data values using pictures.
- **Bar graph:** A bar graph that compares different amounts using either vertical or horizontal bars.
- **Histogram:** Type of bar graph that shows how frequently data occur within certain intervals
- **Pie chart:** A cicular graph that is divided into different sections (or sectors)
- **Line graph:** A graph that uses line segments to connect data points and shows changes over time.
- **Double bar graph:** A bar graph that displays two sets of data.
- **Multiple bar graph:** A bar graph that displays more than two sets of data.
- **Stacked bar graph :**
- **Box and whisker diagram:** Graphical representation of the five number summary.
- **Scatter plot:** A graph that is made by plotting ordered pairs to show the relationship between two sets of numerical data without connecting it with a line.
- **Dependent value:** A variable whose value depends on another.
- **Independent value:** A variable which is not changed by other factors.
- **Outlier**: A data value which is much bigger or much smaller than the rest of the data values.

Activity 1:

Match the definitions in column B with the terms in column A:

	Column A	Column B	Answer
1	Median	(a) ||||	
2	Discrete data	(b) 2; 4 ; 8 ; **40**; 6	
3	Lower quartile	(c) {51 ; 52 ; 53 ; 54 }	
4	Outlier	(d) Normally represented on the vertical axis.	
5	Dependent value	(e) 3; **5**; 7; 8; 9; 10; 12	
6	Tally	(f) 13; 20 ; **29** ; 30 ; 33	

Note:

In grade 10 data is limited to a single set of data.

In grade 11 it is expected to work with two sets of data and comparisons thereof.

In grade 12 learners must be able to work with multiple sets of data and comparisons thereof, including the box and whisker diagram.

1. Developing questions:
(a)   Questions must contain real life contexts, unbiased, sensitive towards culture, religion, race and not be open ended.
(b)   Questions can be developed in the form of a questionnaire, interview or by observation.
2. Collecting data:
Data can be collected using observations, interviews and questionnaires.
3. Classification and organising (sorting, arranging) data:

Data can be classified and organised using Categories, numerically and by   using tally and frequency tables.

4. Summarising data:

Data can be summarised by measures of central tendency and spread.

5. Data can be represented graphically using statistical graphs.
6. Data can be analysed using central tendency values and measures of spread values and diagrams.

Activity 2
Teachers are asked to give the ages of their first born children.
Questions from the data:
(a)   Organise the data in the form of a frequency table.
(b)   What is the modal age?
(c)   Determine the median, range and mean of the data.

Activity 3

3.1

> Lindi has grandchildren of whose ages as shown: 3; 4; 5; 8; 8; 12; 13; 14; 16. Use the information to answer the following questions:

    3.1.1   Three of the grandchildren are girls. Determine the number of boys.

    3.1.2   Determine the range from the ages of the girls given that their ages are odd numbers.

3.2

> A research was carried out among grade 12 learners in a high school to find out the most popular dress code for an end year party in 2016. Use the results displayed in ANNEXURE A to answer the following questions.

    3.2.1   Write down the number of learners who took part in the research.

    3.2.2   Identify the most popular dress code.

    3.2.3   Determine the number of boys who preferred traditional dress code.

QUESTION 3
ANNEXURE A: CLASS RESEARCH FOR THE POPULAR DRESS CODE FOR THE PARTY:
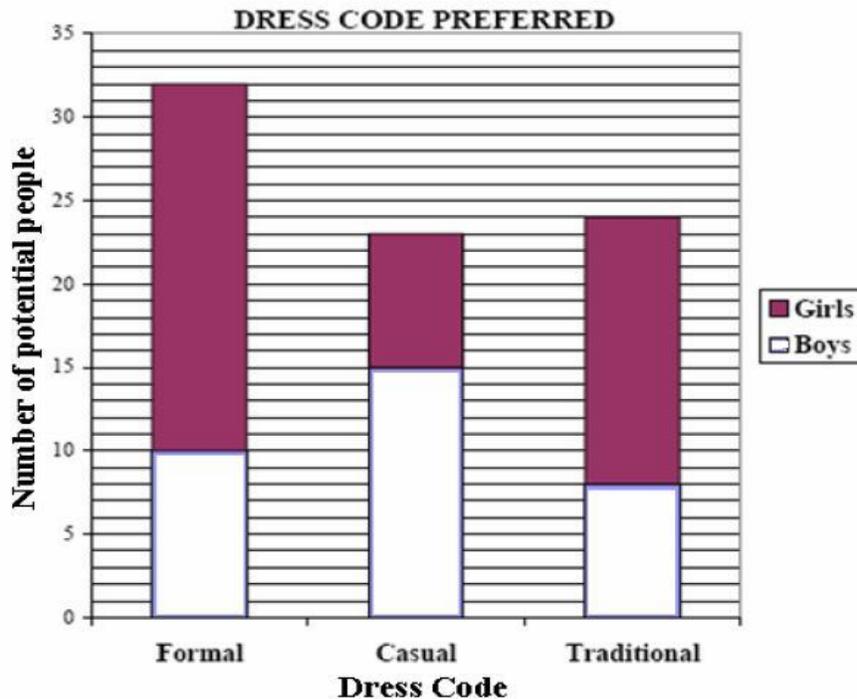
Activity 4
QUESTION 4(D)

TABLE 4 shows the fastest twenty four 100 m sprints of all times, all covered at under 9,9 seconds per 100 m. The names of the sprinters, their nationalities and the date of the sprint are also shown.

TABLE 4: Time, sprinter, nationality and date

Time (in seconds)	Sprinter	Nationality	Date
9,58	Usain Bolt	Jamaican	16 August 2009
9,58	Tyson Gay	American	20 September 2009
9,69	Yohan Blake	Jamaican	23 August 2012
9,72	Asafa Powell	Jamaican	2 September 2008
9,77	Justin Gaitlin	American	5September 2014
9,78	Nesta Carter	Jamaican	29 August 2010
9,79	Maurice Green	American	16 June 1999
9,80	Steve Mullings	Jamaican	4 June 2011
9,82	Richard Thompson	Trinidadian	21 June 2014
9,82	Donovan Bailey	Canadian	27 July 1996
9,84	Bruny Surin	Canadian	22 August 1999
9,84	Leroy Burrell	American	6 July 1994
9,85	Olusoji Fasuba	Nigerian	12 May 2006
9,85	Mike Rodgers	American	4 June 2011
9,85	Carl Lewis	American	25 August 1991
9,85	Frankie Fredericks	Namibian	3 July 1996
9,86	Ato Boldon	Trinidadian	19 April 1998
9,86	Francis Obikweju	Portuguese	22 August 2004
9,86	Keston Bledman	Trinidadian	23 June 2012
9,86	Linford Christie	English	15 August 1993

9,87	Obadele Thompson	Barbadian	11 September 1998
9,87	Shawn Crawford	American	19 June 2004
9,87	Walter Dix	American	8 August 2010
9,88	Ryan Bailey	American	29 August 2010

4.1   Determine the number of years and months (and days) between the **earliest** and **latest** date on which those above sprint times were achieved.   (2)

4.2   List the number of sprinters in Table 4 from Africa as a fraction   (2)

4.3   What is the probability that one of the sprinters in Table 4 is from a Caribbean island?   (2)

4.4   Determine the median time set by the sprinters in Table 4   (2)

4.5   Which time lies at the lower quartile? (leave your answer correct to 3 decimal places)   (2)

4.6   The South African record for the 100 m sprint was set by Simon Magakwe on 12 April 2014. His time was 9,98 seconds. If he had run this time in the same race as the one set by world record holder Usain Bolt, by how far In metres) would Usain Bolt have beaten him?   (3)

[13]

Activity 5

The cost of attending the AMESA National Congress has been increasing due to the annual inflation rate. The diagram below shows the Real GDP (Gross domestic project) and Inflation percentages for 2000 to 2014.

The GDP percentage shown is the rate at which the economy of the country is growing on an annual basis

NB: The horizontal axis shows the years and the vertical axis the percentage.

Real GDP Growth & Inflation (%)

Source: IMF
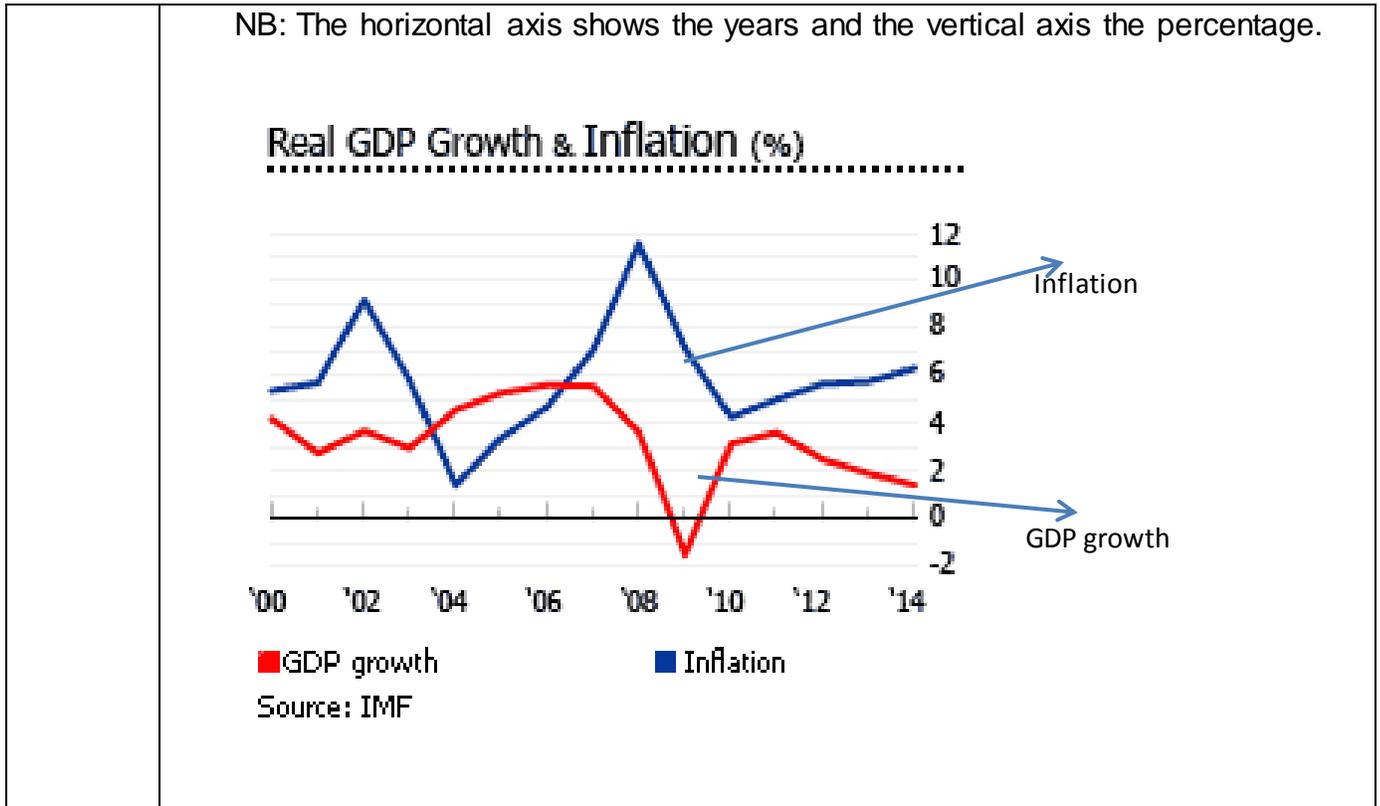
5.1.1. Describe the trends from the graph.   (3)

5.1.2 Use these trends to predict whether the gap between inflation and GDP growth
would be likely to narrow or widen in 2020.   (2)

5.1.3. From the trend in 5.1.2 from the end of 2003 to end of 2006 what implications
does it have for South Africans?   (2)

Activity 6 (Previous Question Paper)

Violent incidents in South African schools are a national concern. Young persons are as much at risk of being victims of violence at school as they are outside the school.

The stacked bar graph below shows the recorded data of the number of times boys and girls committed certain types of violent acts at Metro High School during 2013.

**Data showing violent incidents
at Metro High School during 2013.**
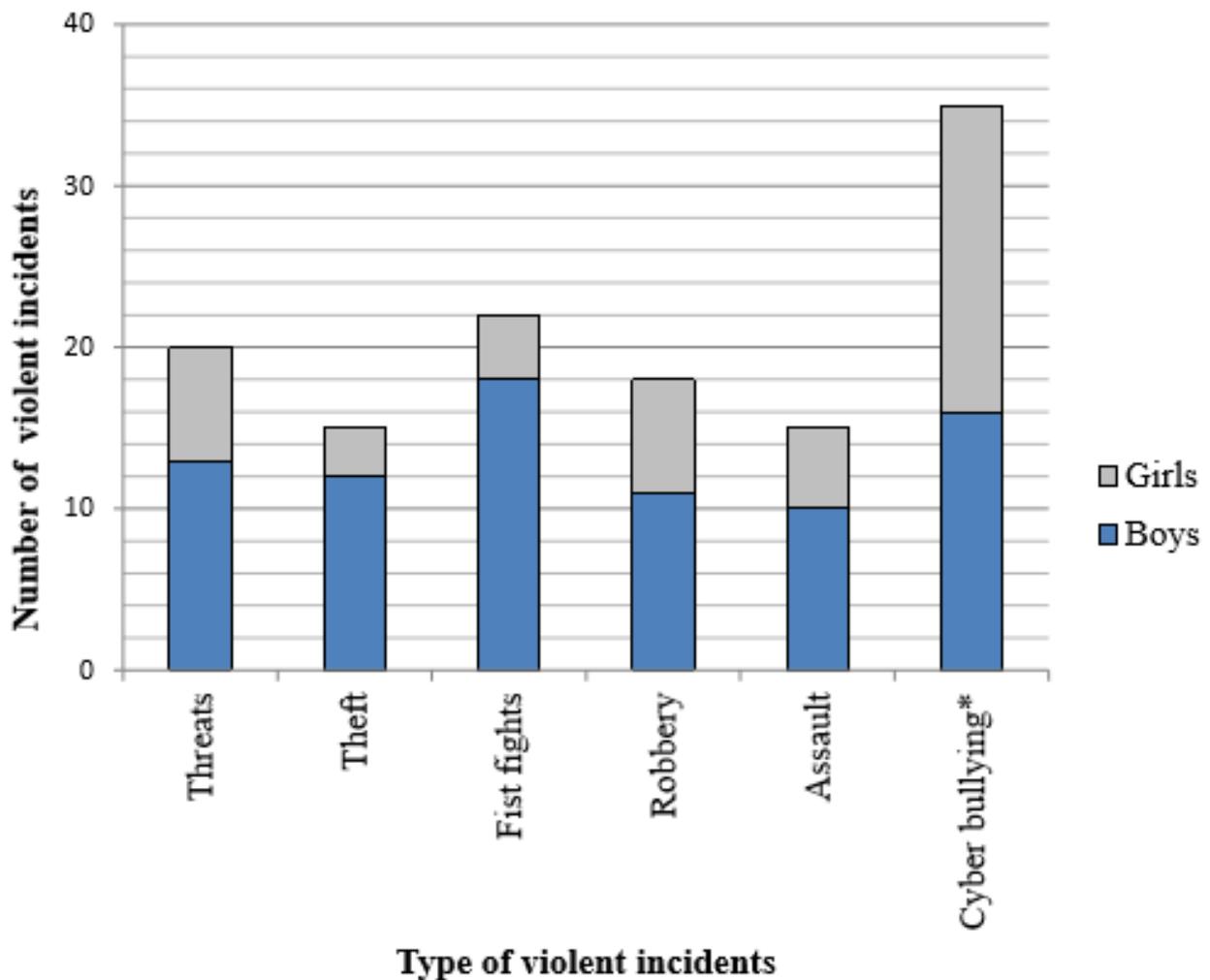
* *Cyber bullying* is the use of social media like *SMS, BBM, WhatsApp, Facebook, Twitter, et cetera* on cellphones, tablets or computers to deliberately harass, threaten or intimidate another person.

[Adapted from the South African School Administration and Management System]

1.1.1   Explain, with justification, whether the given data is discrete or continuous.

1.1.2   Determine how many more boys than girls were involved in violent incidents at Metro High School during 2013.

1.1.3   Determine the modal violent incident committed by girls at Metro High School during 2013. Explain why this type of incident is the modal violent incident committed by girls.

1.2   The majority of Metro High Schools' learners who committed violent incidents were Grade 9 boys.

The arranged ages of these Grade 9 boys and a corresponding box-and-whisker plot are given below.

| A	14	14	14	14	15	15	15
15	15	16	16	16	16	16	16
16	16	16	16	17	17	17	17
17	17	17	17	17	17	17	17
17	18	18	18	18	18	18	18

B   C   D
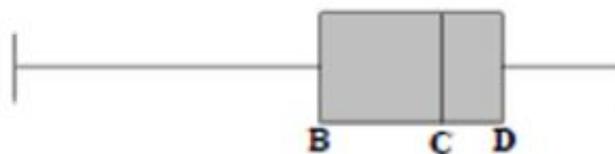
[Adapted from the South African School Administration and Management System]

1.2.1   Determine the missing value **A** if the range of the ages of the Grade 9 boys who committed violent incidents is 5 years.   (2)

1.2.2   Calculate the mean age of the Grade 9 boys who committed violent incidents.   (3)

1.2.3   Calculate the missing quartile values **B**, **C** and **D** of the box-and-whisker plot.   (5)

1.2.4   A Grade 9 boy who committed a violent act is randomly selected. Determine the probability (expressed in decimal form) that the boy would be 16 years or older.   (3)

1.2.5   Give a possible reason why so many Grade 9 boys at Metro High School committed violent incidents.   (2)

Activity 7

2.2 | Daya is interested in the different stages of child development, namely childhood, pre-adolescence and adolescence.

The graph below shows the different stages of child development according to age and average height.

Different stages of child development according to age and average height
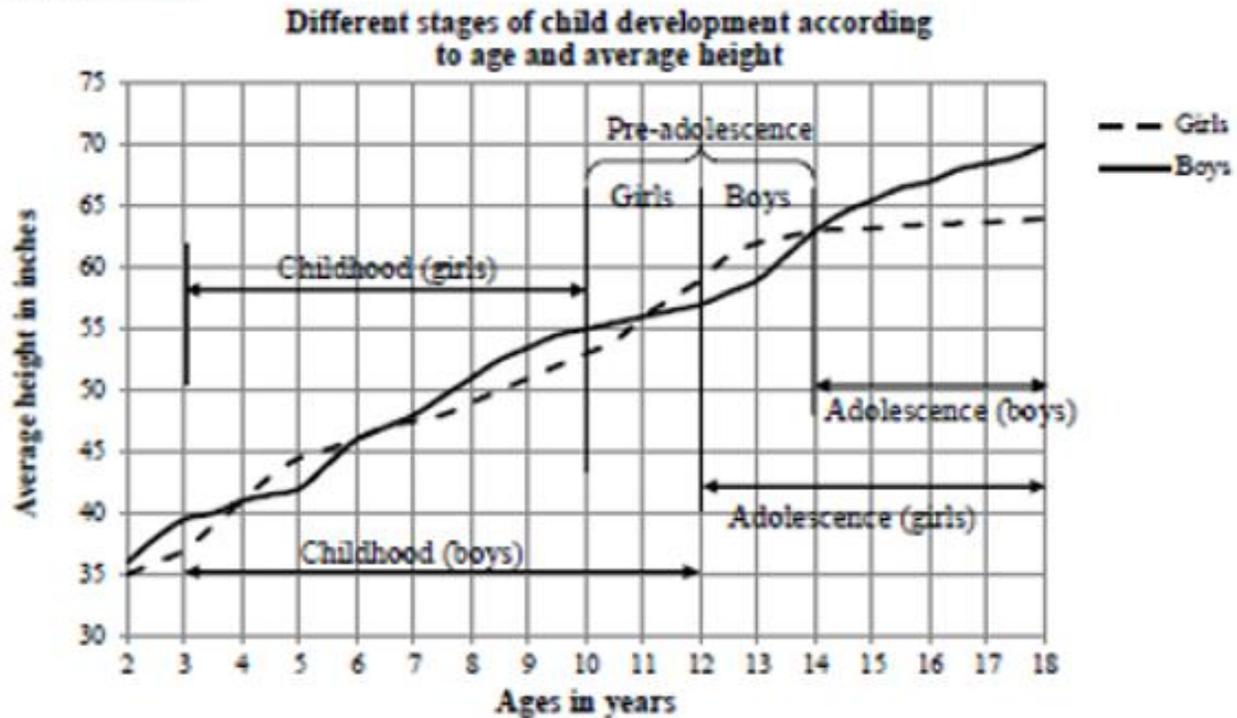
[Source: www.WHO/growthchart]

2.2.1	In which age group will both boys and girls have approximately the same average height for nearly a whole year?	(2)
2.2.2	Give TWO possible reasons why it cannot be said with certainty that a 10-year-old boy will be 55 inches tall.	(2)
2.2.3	Identify the different age groups where the average height of girls is more than that of boys.	(2)
2.2.4	A colleague of Daya made the following statement: 'All the stages of child development for boys are longer than those for girls.' Give a detailed motivation why this statement is NOT correct.	(5)
2.2.5	Describe a possible trend for the average height of girls who are 14 years and older.	(2)
2.2.6	Daya's 14-year-old son is 165 cm tall. Show by calculation whether he is above or below the average height for his age. **NOTE:** 1 cm = 0,3937 inches	(4)