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STUDY Mate

Department of Education

GRADES 8–11 ISSUE 14 OCTOBER 2007

Learning activities for Grades 8–11

Education Minister Naledi Pandor

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Dear Learner

As we move into October we are also moving closer to those end of year exams. Although very few people can claim to love exams, they are also nothing to be afraid of - provided, of course, that you are well prepared! Of course the matric exams start very soon and we wish all our matrics everything of the best. For the rest of you we have this message: don't wait until you are in Grade 12 to become serious about studying. Whether you are currently in Grade 8 or in Grade 11, you only have a few years in which to make sure that what you end up doing for the rest of your life is something you really want to do. Don't think that what you are doing now doesn't really matter - the better you do now, the more choices you have when you decide on a field of study or a career path. In the meantime, though, you can put in a little extra effort with the help of this issue of Study Mate. You can improve your knowledge of English figurative language, practise your maths literacy, take up the challenge of the Maths Olympiad by practising some sample questions, and test your accounting skills. And don't forget to eat properly, and get some rest and exercise. We hope you have a great week!

ENGLISH GRADE 11 LESSON NOTES

FIGURATIVE LANGUAGE

Sarcasm and irony

OVERVIEW

Irony and sarcasm are very common devices and it is critical that you are comfortable with these terms, can find examples in texts, and can discuss examples intelligently.

Lesson

IRONY

In most uses of irony, there is a difference between what is said and what has actually occurred. More than one level of meaning is conveyed. In a general sense, irony exists when there is a conflict between reality and appearance. It can be used by the writer in a variety of forms for a variety of purposes.

Let us start with **visual irony**.

In **visual irony**, there is a difference between what you see and what you expect to see, or between what you see and what someone says about what you see.

This is usually the easiest kind of irony to explain. The irony is conveyed either just in a picture or in a picture with words.

The next kind of irony is **verbal irony**.

Verbal irony expresses a double meaning by stating the opposite of what is actually meant. Verbal irony usually involves the open expression of one attitude or evaluation, but with the implication of a very different attitude or evaluation.

In this kind of irony, the person says something but means or implies the opposite or something very different, in order to make a point. The intention is for the opposite to be understood. The irony exists because one thing is stated or asserted, but something else is implied or suggested. The meaning of the ironic statement is different from what the hearer thinks. The speaker says what is true, but implies MORE than this.

It is the tone that conveys this meaning.

Examples:

1. Think how often we use "charming" as a response to something unpleasant. This is a common use of irony.
2. Teacher to an inattentive class: "Oh my, you're wide awake today!"

   The tone of voice will show irony here, because the teacher is mocking the children and stating the OPPOSITE of what she means.
3. My considerate neighbours upstairs often allow me to enjoy their full-volume rock music until two in the morning.

   The speaker is angry and upset about the noise made by the neighbours. He does NOT mean that they are "considerate"; he means that they are inconsiderate, selfish and horrible.
4. I love marking comprehension tests – it's so stimulating!

   The teacher is being ironic: she HATES marking comprehension answers because they are boring.

5. A very famous example of irony comes at the beginning of Jane Austen's novel, ***Pride and Prejudice:*** It is a truth universally acknowledged that a single man in possession of a good fortune must be in want of a wife.

   Austen clearly does NOT mean that a rich young man automatically wants a wife. What she is implying is that a young woman of marriageable age always wants a rich, young husband.

   Thus this form of irony is mocking in tone.
6. Another well-known example is:

   We have just enough religion to make us hate but not enough to make us love one another.

   The writer is making the point that religion divides people, making them intolerant of the religions and beliefs of other people, and yet most religions preach tolerance and love of one's fellow man. We never have enough religion to get us as far as loving our neighbour. We just have enough religion to make us hate one another.
7. Clarissa was full of the tenderest consideration for others – as long as it caused her no trouble.

   The speaker is mocking Clarissa. She is clearly not a considerate, caring person. She does not mind thinking about others just as long as her own comfort is not impeded. She is insincere in her apparent concern for other people; at heart, she is entirely selfish.
8. In Wilfred Owen's anti-war poem, "Anthem for Doomed Youth", he intensifies the shock value of the poem by using a series of ironic contrasts: human beings are described as cattle; funeral choirs as wailing shells; prayers as the patter of rifle fire. Irony depends (as in this case) on discrepancies, or differences, between the way a situation appears and its underlying reality. In effect, Owen here says: what do we normally associate with funeral bells, choirs and prayers? Probably the dignity of death, the ceremony of funeral rites. But, in this particular instance, death has no ceremony: men die like cattle, killed by choirs of shells!
9. In the poem, "City Johannesburg", Mongane Wally Serote is chilled by city life and dislikes it. He writes:

   "Joburg City, I salute you"

   but, in fact, he does not really wish to salute the city. He is being ironic.
10. In *A Man for all Seasons*, by Robert Bolt, Cromwell says to Sir Thomas More: "I am one of your multitudinous admirers, Sir Thomas." When he means both that he isn't, and that many people do not admire More.

Note:

Sometimes the use of irony is very complex; the meaning and evaluations may be difficult to notice and just a little different from what they seem, rather than just the opposite. The clues to the ironic "other" meaning under the surface statement may be indirect and hidden. That is why an author's use of irony is often an implicit compliment to the intelligence of the reader. You must be awake and clever to pick up the irony.

Purpose

Irony can be:

- A very effective way of conveying dislike or disapproval
- Mocking and satirical
- A means of criticising behaviour and attitudes
- Subtle and incisive, adding depth to a text
- Used to show up people's pretence, self-deception and folly in an amusing way. This use of irony usually carries a tone of tolerant amusement
- Can take the form of fierce and wounding criticism that arouses anger or indignation
- Is especially effective when the writer pretends to admire and respect someone's behaviour and ideas in order to ridicule them or reveal their vices

Another kind of irony is called ***situational irony***.

Situational irony or irony of situation occurs when:

- Someone sets out to do something and achieves the opposite
- The opposite of what is expected occurs
- The outcome of a situation is the opposite of what was expected.
- There is incongruity between what would seem appropriate and what actually happens

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ENGLISH GRADE 11 LESSON NOTES

Examples:

1. In Shakespeare's *Romeo and Juliet*, Romeo goes to Capulet's ball to see the girl of his dreams, Rosaline. However, when he arrives, he sees Juliet and falls in love with her. He never gives Rosaline another thought!

2. The laziest boy in the class is now the richest man.

   The irony lies in the fact that his classmates would have expected the lazy boy to fail, but he has become wealthy - one sign of success.

3. In a Second World War movie, some prisoners of war plan to escape. The man in charge keeps warning them that they must think in German and not be caught out if someone speaks to them in English. Ironically, a German officer wishes him "Good luck" on the train station, to which he replies, "Thank you", and is, of course, caught! The irony lies in the reversal of expectation: he is caught in the way he kept warning the others against.

Note:

When it seems as if fate has mockingly caused events to turn out in an unexpected or surprisingly appropriate way, this is seen as ironic.

This is often referred to as **cosmic irony.**

Cosmic irony occurs where God or destiny is shown as manipulating events so as to frustrate the lives of characters.

Examples:

1. A murderer may mistakenly drink the poison he has prepared for his intended victim.

2. In the short story, "The Turn of the Tide" by C S Forester, one man kills another. He pulls the man's arms around his neck in order to carry him down to the sea. Then rigor mortis sets in. (*Rigor mortis* is when the body grows cold and stiff after death.) The dead man's arms become so hard, that the murderer cannot pull them away from his neck. The murderer drowns because the stiff arms of his victim are around his neck and he cannot escape. This is an example of cosmic irony.

Dramatic irony occurs in a novel or play when:

- The reader or audience knows something that a character is unaware of
- The reader or audience understands more about a situation than those involved
- The implications of a situation, speech or statement are understood by the reader or the
- Audience, but not by the character(s) involved
- When tragic or comic circumstances can be foreseen by the reader or audience

Examples:

1. In a play or film, the audience can see the gang members hiding behind the garbage bins, but the other characters are not aware of this, and therefore speak as though they are perfectly safe whereas they are about to be attacked.

2. In Shakespeare's *Hamlet*, Hamlet calls Polonius, an elderly courtier, a "fishmonger". Polonius thinks that Hamlet is mad. The audience understands Hamlet to mean that Polonius is

   a. a pimp

   b. a fisher for secrets

3. In Shakespeare's *Romeo and Juliet*, Romeo says to Juliet in the tomb: "Death ... hath sucked the honey of thy breath". He believes Juliet to be dead, but the audience knows she is not!

Note:

1. Dramatic irony involves a situation in a play or narrative in which the audience shares with the author knowledge of which a character is ignorant.

2. The speaker is unaware of the full significance of what he is saying and so he/she:

   - acts in a way grossly inappropriate to the actual circumstances
   - expects the opposite of what fate holds in store
   - says something that anticipates the actual outcome, but not at all in the way that he/she means it

Purpose

- This technique heightens tension and expectation.
- It can be used to show the tragedy or sadness of a situation.

Some critics refer to **tragic irony**

Tragic irony
In this type of irony, there is a difference between people's hopes and dreams and what they can realistically achieve. Most of this irony comes from the idea that, while we are young, we never accept that we must grow old and die. People are doomed to failure and must live with frustration and death while longing for success and immortality.

In his speech about Alexander the Great and Caesar, Hamlet uses tragic irony by reminding us that even great men return to dust (Shakespeare: *Hamlet*)

To sum up

1. Irony always implies **double meanings** in the use of words: a literal and surface meaning, and another, hidden meaning that contradicts the surface one.

2. Irony also implies a **double audience**: the author and the reader are, of course, conscious of the ambiguous meanings of the words; sometimes, in addition, SOME of the characters in a novel or play share the insight of the author and reader (or spectator).

3. The delight of irony has been described as a '**secret intimacy**' set up between the audience and author.

4. Irony in all its forms provides extra dimensions of meaning. It suggests meanings without stating them, and thus promotes reader involvement. But this can also lead to one of the dangers of using irony. If the irony is read only on the first or surface level, the reader will misinterpret the writer's purpose. The writer is assuming that the reader has enough skill and intelligence to see through the surface meaning to the true purpose of the writing.

   Thus, to detect irony, the reader has to have deep insight into the true nature of a character, or know what should have occurred, or have some special knowledge. Irony forces the reader to think and study situations closely, and, therefore, it is more effective than stating things directly.

SARCASM

Sarcasm means to say something in a sharp, bitter, cutting manner.

There are **two** kinds of sarcasm:

1. **Sarcasm** is the crude and blatant use of apparent **praise for dispraise**.

2. **Sarcasm** states **the truth** with the intention of hurting, humiliating or insulting.

Notice that some uses of sarcasm can state the opposite (using praise for dispraise) while other uses of sarcasm state the truth. What makes sarcasm different from irony is that the intention is to be deliberately hurtful or spiteful.

Thus sarcasm is an extreme, bitter or cruel use of irony in which the speaker or writer intends to be deliberately hurtful or spiteful. The aim is to belittle and insult whomever (or whatever) is the target of the sarcasm. It is directed at a person and meant to hurt.

Examples:

1. Teacher to student who has scored 12%:

   "You probably don't have a brain in your head."

2. Said to a practical joker: "You're so clever, aren't you?"

3. So you've lost the key. *That's fine!*

   The speaker obviously means that it is not fine that the key has been lost. The speaker is stating the opposite of what she means.

4. He started the day *really well* by getting wet through.

   Again, the speaker is stating the opposite of what she means: it is not a good start to a day to begin by being soaked. This is an example of sarcasm because the speaker is being nasty about the person and intending to hurt them by suggesting that it was the person's fault that he got wet.

5. Here is an example of sarcasm used to express scorn, anger or ridicule: in *Julius Caesar*, Mark Antony speaks of his political opponents as "honourable men – all honourable men". Antony uses words of praise when, clearly, the exact opposite is intended - Antony regards the conspirators as dishonourable murderers.

6. "His proper home is in the stable." This is a bitter or wounding remark, openly stating just what it means to convey: the person being criticised has no civilised manners or refinement and so belongs in a stable, not in a person's home. The speaker says exactly what he means, with the intention to wound.

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ENGLISH GRADE 11 LESSON NOTES

Note:

1. Sarcasm most often occurs in direct speech.
2. Sarcasm comes from the Greek meaning to rip or tear.
3. Sarcasm often states a cruel truth.

   Examples:

   (i) I suppose you're here to ask for help again!

   (ii) Late as usual!

   (iii) You are so clever. I'm quite stunned by your brilliance!
4. Sarcasm is a taunting remark, often ironic, but tending to be bitter or ill-natured, while irony need not be.
5. A sarcastic remark is always offensive or intended to hurt. Do not confuse irony with sarcasm.

Activities

We have discussed the fact that there were similarities and differences between irony and sarcasm.

Outline the **similarities between irony and sarcasm.**

Answers and assessment

1. Both intend to insult, hurt and make fun of their victims.
2. Both may be uttered or written in a "sarcastic" tone of voice that makes the intention clear.
3. Irony always works indirectly through pretence, whereas sarcasm (from the Greek sarkazein, to tear flesh) attacks openly.

Example:

Imagine a scene where a wife and a husband are washing up and he breaks something.

Here are two possible responses from the wife:

Sarcasm: "It's clumsy idiots like you that keep the supermarket's profits up. Have you got shares?"

Irony: "What a skilful, masterly touch you have, darling. Have you ever thought of working in a shop selling glass?"

Helpful tips

Sarcasm works on a lower intellectual level than irony. "This is stupid! I hate it!" is the gist of its message. It appeals to the emotions rather than the brain, leaving us with negative feelings of dislike, anger and contempt. Irony, in contrast, forces us to think. "Look at this" the ironist says with humour. "See how good, how fine, how unselfish, how intelligent this is! Don't you love it?" And because the ideas or behaviour have been exaggerated just enough to bring out their true quality, we realise that:

- We do not love it at all; and
- We know exactly why we dislike it.

Listening to pretended praise or support of things that are bad has clarified our ideas about what is good. We have been pushed into making a moral choice.

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MATHEMATICAL LITERACY GRADE 11 LESSON NOTES

RATE

An introduction

OVERVIEW

INTRODUCTION

In this lesson we continue our study of ratios, but we will look at a special family of ratios called rate.

- A rate is a ratio where the two quantities being compared have different units.
- The unit of the rate is given by the ratio of the unit of the first quantity to the unit of the second quantity.
- A ratio has no units.

In our very first example of ratio we mixed cold drink in the ratio: concentrate : water = 1 : 3

We could choose the unit we wanted to work with for example we could use 1 cup of concentrate and 3 cups of water or 1 jug concentrate to 3 jugs water.

By contrast, a rate is a ratio with units. If we buy a 2*l* bottle of milk and pay R8,50 for it we can write this as a comparison: cost : amount = R8,50 : 2*l*

This time, the units are important and we say "R8,50 per 2 litres". The unit of the rate is rands per litre or R/*l*.

Supermarkets often give us the unit rate of groceries to help us compare prices of products so that we can get the best value for our money.

- Unit rates compare the first quantity to 1 unit of the second quantity.

Examples of rate include:

- Electricity rates (tariffs);
- Exchange rates;
- The petrol price is quoted in rands per litre;
- Crime rates; and
- Inflation rates.

Methods and worked examples

Which one of the following items gives better value for money?

5 kg of coffee that costs R165,00; or

2 kg of coffee that costs R58,00

To be able to compare these two quantities we need to change the given rates to unit rates.

5 kg of coffee: Rate = R1655 kg = R331 kg = R33/kg

2 kg of coffee: Rate = R582 kg = 291 kg = R29/kg

The unit rate of the 2 kg tin of coffee is cheaper than the 5 kg unit rate and is therefore the better buy.

Consider the following example:

How much must I pay for electricity if I use 255 kWh and the municipality charges 36,06c/kWh?

Solution:

Cost = consumption × rate
= 255 kWh × 36,06c/kWh = 9195,3c

Therefore you will pay R91,95.

Activities

1 Tickets to a concert cost R35/child and R100/adult. Calculate how much it would cost a family consisting of 2 adults and 3 children.

2. Muffins at the local bakery cost R3,50 each or you can buy a pack of 4 for R13,00.
   2.1 Which is the more economical buy?
   2.2 When would it not be wise to buy the more economical muffins?

3. Calculate the unit rate per kilogram of the following item in cents:
   5 kg of sugar at R10,99

4. You earn R60 for 8 hours of work and your friend earns R70 for 9 hours of work. Who gets the better hourly rate?

5. Calculate the petrol consumption of my car in km per litre if I used *50l* of petrol to travel 520 km.

6. The rand/dollar exchange rate is R7,12/$.
   6.1 Calculate the number of rands I would receive if I exchanged $35 for rands.
   6.2 How many dollars can I buy for R8 000?

7. Which is the better buy?
   500 g of butter @ R17,99 or 250 g of butter @ R11,49.

Answers and assessment

1. R370
2. 2.1 The packet of four muffins.
   2.2 It would not be economical if you only wanted one muffin and the rest of the muffins went stale.
3. 219,8 c/kg
4. You: rate = R7,50/hr
   Friend: rate = R7,77/hr ----- better rate
5. 10,4 km/*l*
   6.1 R249,20
   6.2 $1 123,60
7. 500 g: rate = 3,6c/g ------ more economical.
   250 g: rate = 4,6c/g

HELPFUL TIPS

1. Units are vital when dealing with rates and the units are determined by the context of the problem.
2. Context is important in rate problems as in some cases you want the lower rate (see activity 7) and in other cases you want the higher rate (see activity 4) and your choice is determined by the context. If in activity 7 you worked out the rate as grams per cent then you would choose the higher of the two rates to get the better value for your money. This problem highlights the need for units and the need for context.

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MATHEMATICAL LITERACY GRADE 11 LESSON NOTES

Average rate

OVERVIEW

INTRODUCTION

We will focus on three kinds of rate in the next three lessons:

- Average rate;
- Constant rate; and
- Varying rate.

In this lesson we will consider average rate. Average speed is an example of average rate. A driver's speed varies as he drives because it is not possible to maintain the same speed throughout a journey. Sometimes he/she will go faster than at other times, but if he/she takes 5 hours to drive 500 km; we say that his/her average speed is 100 km/h.

Other examples of average include:

- The petrol consumption of a car – reported in litres per 100 km;
- The average rainfall for the months of the year – reported in mm per day/week/moth/year; and
- The run rate of a cricketer – reported in runs per inning.

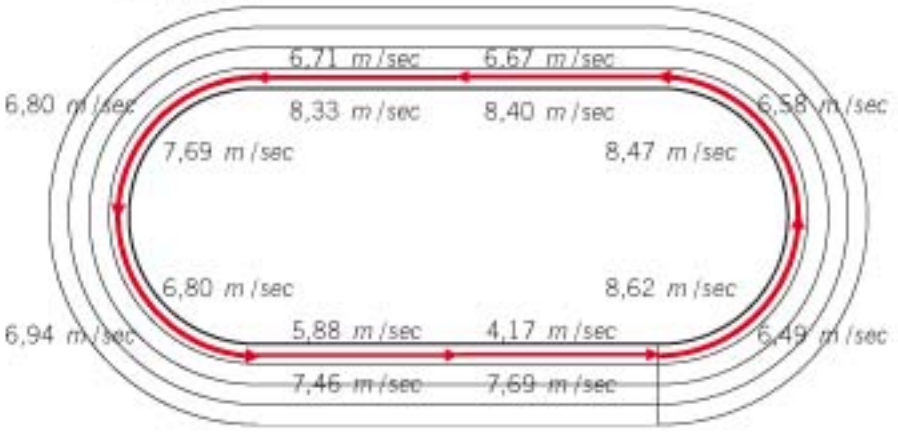
Methods and worked examples

Two athletes, Paul and Hendrick, compete in a 400 m running race. Paul starts out at a fast pace but is unable to maintain his speed and slows down at the end of the 400 m. Hendrick ran a more even paced lap and managed to achieve the same finishing time.

Worked example:

The diagram of the 400 m track below shows the speed of the two athletes for every 50 m. Paul's results are on the inside of the track and Hendrick's results are on the outside of the track. We can see that Paul started the race at a faster pace than Hendrick, but finished at a slower pace. The athletes had exactly the same finishing time for the race and, if we calculate their average speed over the whole 400 m, we get the same average speed. We calculate their average speed as follows:

$$\text{Average speed} = \frac{\text{total distance}}{\text{total time}}$$
$$= \frac{400\text{ m}}{58\text{ s}}$$
$$= 6{,}90\text{ m/s}$$



To summarise:

- Two athletes can have exactly the same finishing time for a race and by having the same finishing time for the same distance, their average speed will be the same;
- The two runners may have run the race very differently;
- The average rate gives us an overall picture of the event and not the details;
- The average rate does not imply that the runners ran at that speed for the entire race.

Consider the following example:

Below is a record of the amount per month that Soso spent on telephone calls. Calculate the average amount per month that she spends on her phone bill.

Month	Amount
January:	R342,75
February:	R267,53
March:	R453,65
April:	R245,98
May:	R320,56
June:	R403,76

Solution:

Average rate = total amount/total number of months

$$= \frac{\text{R2 034,23}}{\text{6 months}}$$

= R339,04 per month

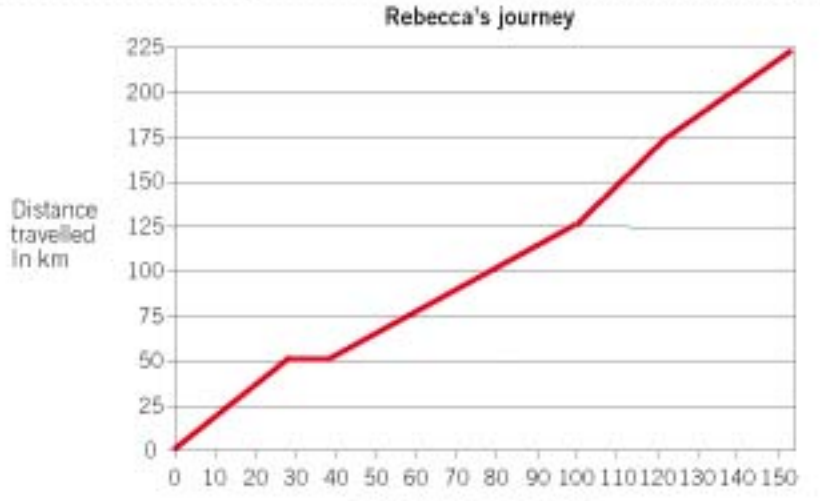
Activities

1 Jusaf works as a car guard. Below is a record of his earnings for one week.

Monday:	R48,00
Tuesday:	R56,50
Wednesday:	R43,60
Thursday:	R84,00
Friday:	R76,30
Saturday:	R104,60
Sunday:	R34,00

Calculate his average earning per day.

2 Rebecca travelled 225 km to visit her friend. The graph shows the time it took her to travel certain distances.



2.1 Did Rebecca travel at the same speed for the entire journey? Explain your answer.

2.2 How long did the journey take in hours?

2.3 What happened after 30 minutes of travelling?

2.4 Calculate her average speed for the journey.

3. The average petrol consumption for Josie's car is 9,6 l/100km.

3.1 Why is the petrol consumption of a car an example of average rate?

3.2 Calculate approximately how many litres of petrol Josie will use for a journey of 780 km.

4. A family of 5 consumes on average 2,5 l of milk per day.

4.1 Does this mean that every day the family drinks exactly 2,5 l of milk? Explain your answer.

4.2 Why is it useful to calculate the average daily milk consumption of a family?

4.3 The price of a 2 l container of milk is R9,56. Calculate how much a family of five must budget for their monthly consumption of milk. Assume a month has 30 days.

5. You work as a waitron in a restaurant. You earn on average (including tips) R110 per day.

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MATHEMATICAL LITERACY GRADE 11 LESSON NOTES

5.1 Why is this an example of average rate?

5.2 Calculate how much you could possibly earn in a week (6 working days)?

Answers and assessment

1 R63,86/day

2.1 No, her speed varied throughout the journey. At times she drove faster than at other times and at one point she stopped for 10 minutes.

2.2 150 minutes = 2,5 hours

2.3 She stopped.

2.4 90 km/h

3.1 Petrol consumption of a car is not constant. A car uses more petrol for town driving because of all the stops and starts. Petrol consumption is better on the open road.

3.2 = 74,9 l

4.1 No, on some days they could consume less than 2,5 l and on other days they could consume more.

4.2 It is useful to know how much milk to buy and it also helps to be able to budget.

4.3 R358,50

5.1 Tips vary daily so you do not always earn exactly the same amount every day.

5.2 R660

HELPFUL TIPS

1. A common mistake that people make is to think that the average speed is the speed at which the runner ran the whole race. They think that the runner ran at a constant speed equal to the average speed. But this is not the case.
2. The average speed or rate gives an overall picture for the event and not the actual details.

Constant rate

OVERVIEW

INTRODUCTION

In this lesson we look at constant rate. We saw in the previous lesson that average rate does not tell you what actually happened at any one time but gives you the overall effect of what actually happened. In constant rate situations, the rate between the two quantities being compared is independent of the size of the quantities being compared.

An example of a situation where it is important that the rate remains constant throughout the time period is when a patient is receiving medication via an intravenous drip.

Methods and worked examples

The intravenous drip sets used in hospitals use rates in terms of the number of drops that they deliver per ml. There are typically three types: 15 drops/ml; 20 drops/ml and 60 drops/ml (used with children). Nurses must calculate the number of drops per minute to which they must adjust the drip to ensure that the patient receives the dosage prescribed by the doctor.

Worked example:

To what rate must the 15 drops/ml drip be adjusted if 1 litre of solution must be administered over a period of 6 hours?

The rate of the solution dosage is:

Dosage rate: $= \frac{1\,000 \text{ ml}}{6 \times 60 \text{ min}}$

$= 2{,}77$ ml/min

Drip factor: $= 15$ drops/ml

Therefore the drip rate is: $= 2{,}77$ ml/min $\times$ 15 drops/ml

$= 41{,}66$ drops/min

$= 42$ drops/min (rounded up)

This means that patient will be receiving the medication at a rate of 42 drops per minute.

Consider the following example:

A drip bag contains 450 ml of medication. The 20 drops/ml drip set is delivering 50 drops/min. How long will it be before the nurse must replace the bag?

Solution:

Flow rate $= 50$ drops/min

Drip rate $= 20$ drops/ml

Therefore the dosage rate is $= \frac{50 \text{ drops/min}}{20 \text{ drops/ml}}$

$= 2{,}5$ ml/min

Time taken to administer 450ml of the solution $= \frac{450 \text{ ml}}{2{,}5 \text{ ml/min}}$

$= 180$ minutes

$= 3$ hours

Activities

1. A doctor prescribes 3 litres of fluid to be given to a patient over 24 hours. The type of drip to be used has a drip factor of 15 drops/ml. Calculate the drip rate.
2. A doctor prescribes 500 ml of fluid to be given to a patient over 4 hours. The type of drip to be used has a drip factor of 20 drops/ml. Calculate the drip rate.
3. A drip bag contains 450 ml of medication. The 15drops/ml drip set is delivering 31 drops/min. How long will it be before the nurse must replace the bag?
4. A water tank has a capacity of 10kl. A pump pumps water out at a constant rate of 25 l/min. How long will it take to empty the tank?

Answers and assessment

1. 31 drops/ml
2. 42 drops/ml
3. 3,6 hours
4. 6,7 hours

HELPFUL TIPS

1. In the worked example on constant rate, the rate does not depend on the interval we look at. When the drip is set up the way it is, exactly 2,5ml will be delivered every minute. After 10 minutes 25ml will have been delivered and after 20 minutes 50ml. every minute is like every other minute.
2. If you plot a graph of a constant rate problem the graph will be a straight line. The gradient of the graph represents the rate.

Varying rate

OVERVIEW

INTRODUCTION

In the previous two lessons we have looked at average rate (what the rate would have been if it had been constant) and constant rate (where the rate between two quantities is independent of the size of the quantities being compared ie it is constant). In this lesson we will focus on varying rate – the situation where the rate is changing all the time.

When working with varying rate, it is more important to consider the trend in the rate rather than the average rate.

Examples of varying rate include:

- Children's growth patterns as described in a *Road to Health Chart* (DoH, 2002);
- Exchange rates; and
- The gold price.

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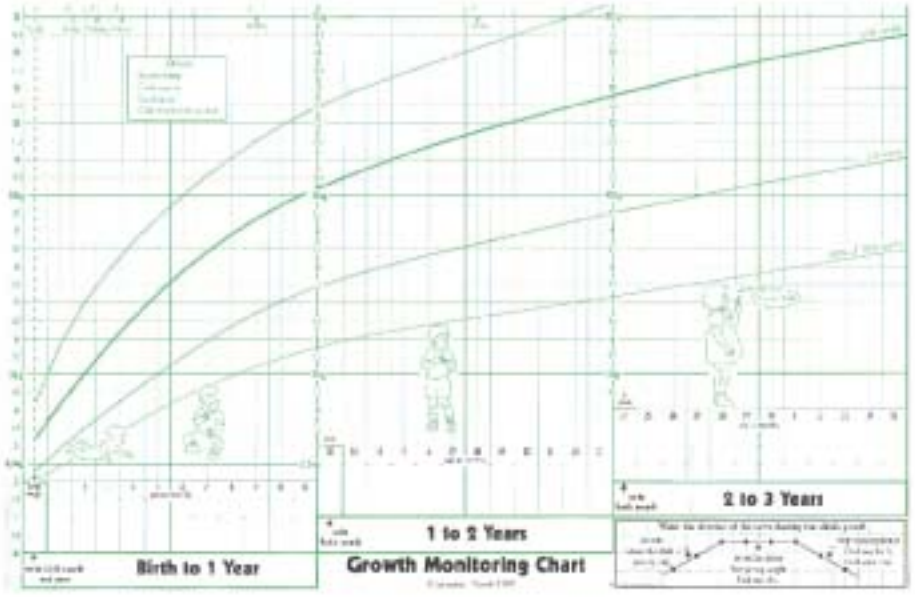
MATHEMATICAL LITERACY GRADE 11 LESSON NOTES

Methods and worked examples

Below is the *Road to Health Chart* (Department of Health, 2002).



The lines on the charts represent the percentiles. For example the 50th percentile (dark line on each of the charts) means that 50% of South African children have a weight less than this weight and 50% of South African children have a weight more than this weight. These lines do not tell you how a child's weight will change but they allow you to compare a child's weight with other children of his/her age.

Worked example:

Consider the 50th percentile line. The amount by which a baby's weight changes each month is as follows:

Age	Weight	Change in weight
Birth	3,25 kg	
1 month	4,15 kg	0,90 kg
2 month	5 kg	0,85 kg
3 month	5,8 kg	0,80 kg
4 month	6,55 kg	0,75 kg
5 month	7,25 kg	0,70 kg

Note:

- The baby's weight increased each month;
- The amount by which the baby's weight increased was different every month; and
- The amount by which the baby's weight increased was less each month.

The growth rate of the baby changed each month. The first month was 0,9*kg/month* whereas the fifth month was 0,7*kg/month*. Although the baby's weight was still increasing, the rate at which this was happening was decreasing.

If we go to eighteen months, the rate of change has decreased still further. See below:

Age	Weight	Change in weight
18 months	11,8kg	
19 months	11,9kg	0,15kg
20 months	12,05kg	0,10kg

Note again:

- The baby's weight increased each month;
- The amount by which the baby's weight increased was different every month; and
- The amount by which the baby's weight increased was less each month.

We notice two trends in this example:

- The weight of the baby is increasing each month – growth rate is positive; and
- The growth rate is slowing down over time.

Of course we can calculate the average growth rate over 20 months as follows (we can calculate anything).

$$\text{Average growth rate} = \frac{12.05\text{ kg} - 3.25\text{ kg}}{20\text{ months}}$$
$$= 0{,}440\text{ kg/month}$$

However, average growth rate is neither useful nor meaningful the weight change varied through the months. Furthermore, there is nothing that could be done with the average weight change – a mother couldn't use it to monitor her childs growth etc. It is more important to be able to discern the trend in the growth rate from the graph than it is to calculate the average growth rate.

Activities

1 Alongisde is a chart showing the percentiles for the body mass index (BMI) for boys from 2 to 20 years.

BMI is a number calculated from a child's weight and height. It is an indicator of body fatness for most children and teens.

Use the chart to answer the following questions:

1.1 Using the 50th percentile, read off and record the BMI values for each year from 2 years of age to 6 years of age.

1.2 Find the amount by which the BMI is changing per year for these years.

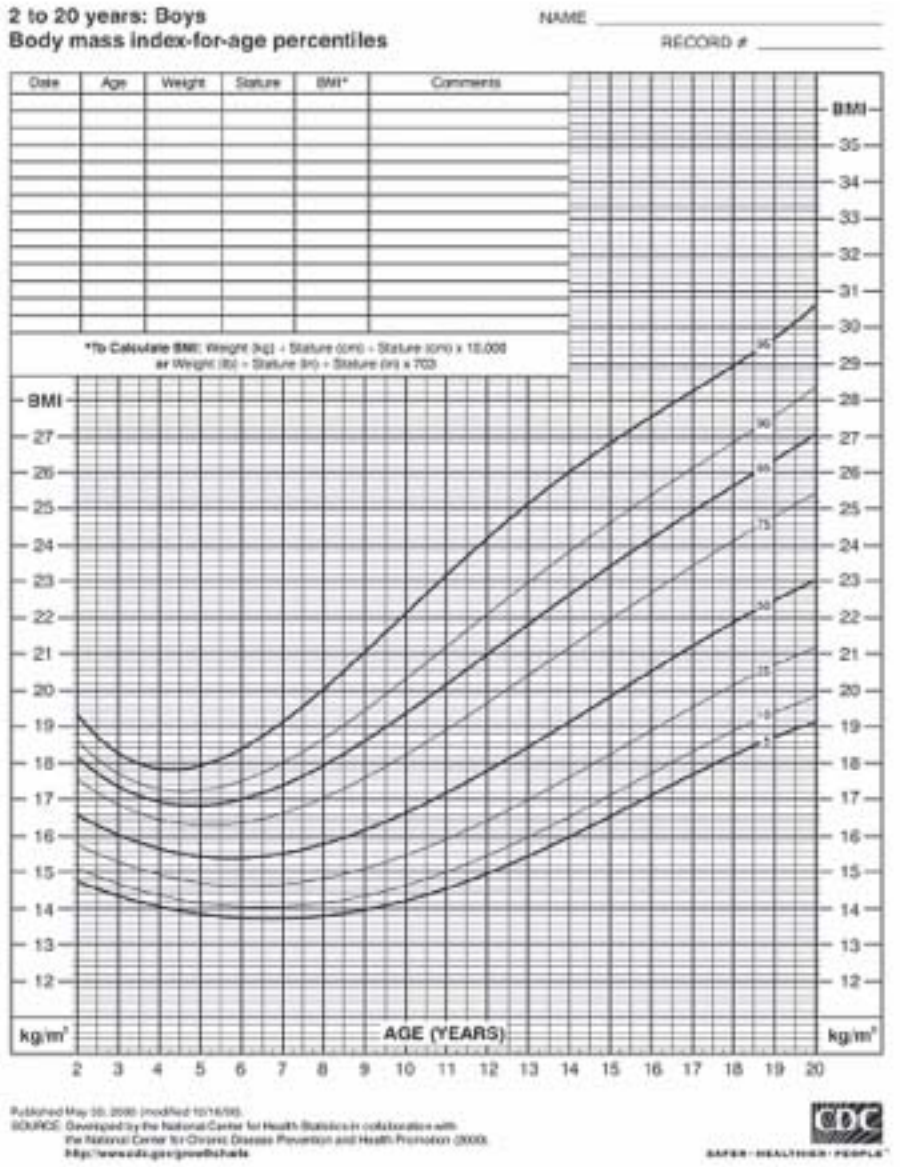
1.3 Describe the trend in the BMI over the period from 2 to 6 years and the trend in the change of BMI per year.

1.4 Using the 50th percentile, read off and record the BMI values for each year from 6 years of age to 12 years of age.

1.5 Find the amount by which the BMI is changing per year for these years.

1.6 Describe the overall trend in the BMI over the period from 6 to 12 years and the trend in the change of BMI per year.

1.7 Explain why it would not be useful to calculate the average change of BMI per year over 20 years.



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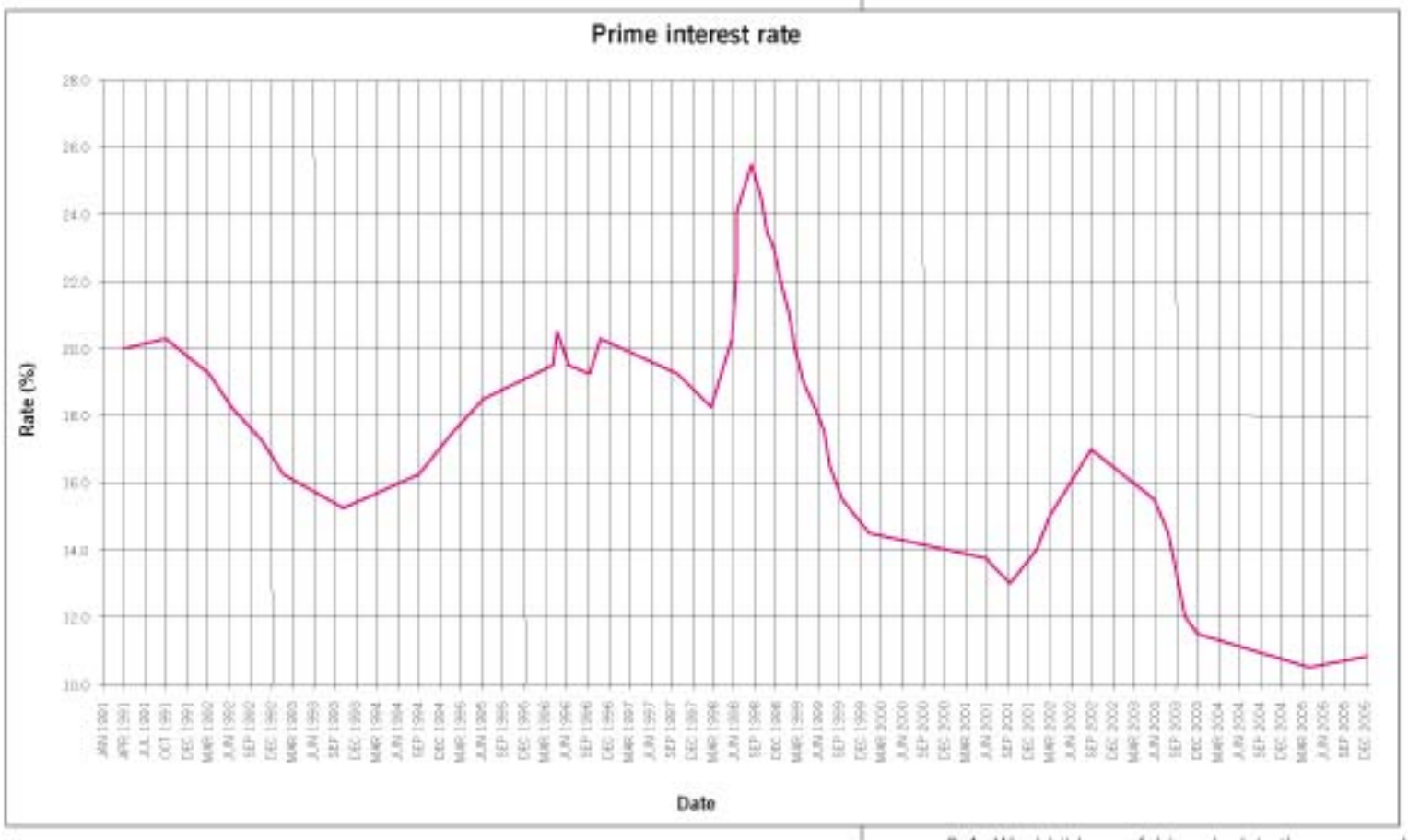
MATHEMATICAL LITERACY GRADE 11 LESSON NOTES

2. Below is a graph of the prime interest rate from the period January, 1991 to December, 2005.



Use the graph to answer the following questions:

2.1 In which month and year was the prime interest rate at it's highest?

2.2 In which month and year was the prime interest rate at it's lowest?

2.3 Describe what happened to the prime interest rate from March 1998 till September 2002.

2.4 Would it be useful to calculate the average change in prime interest rate per year for the 15 year period shown above? Explain your answer.

Answers and assessment

1.1

Years	BMI
2	16,6
3	16
4	15,6
5	15,4
6	15,4

1.2 2–3 years : –0,6 BMI/year
3–4 years : –0,4 BMI/year
4–5 years : –0,2 BMI/year
5–6 years : 0 BMI/year

1.3 The BMI values are decreasing and the amount by which they are decreasing is getting less each year.

1.4

Years	BMI
6	15,4
7	15,5
8	15,8
9	16,2
10	16,6
11	17,2
12	17,8

1.5 6–7 years : 0,1 BMI/year
7–8 years : 0,3 BMI/year
8–9 years : 0,4 BMI/year
9–10 years : 0,4 BMI/year
10–11 years : 0,6 BMI/year
11–12 years : 0,6 BMI/year

1.6 The BMI values are increasing and the amount by which they are decreasing is getting more each year.

1.7 An average rate would not show the trend over the 20 years. You would not know that the BMI actually decreasing till about 6 years of age and then increases again.

2.1 September, 1998

2.2 April, 2005

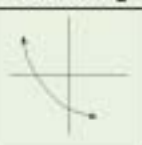
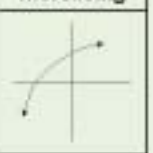
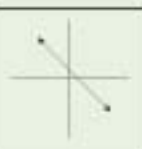
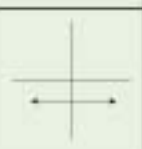
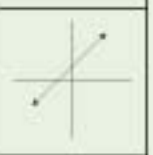
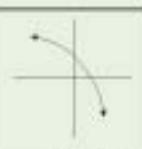
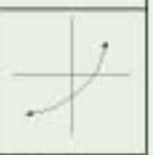
2.3 From March 1998 to September1998 there was a steady, rapid increase in the prime interest rate. From September 1998 to December 1999 there was a sharp decrease in the prime interest rate. From December 1999 to June 2001 there was a decrease in the prime interest rate but it was not as dramatic as the previous decrease. From June 2001 to the September of the same year there was a steeper decrease than the previous interval. From September 2001 till September 2002 there was a steady rise in prime interest rate.

2.4 No, the prime interest rate has varied dramatically over the 15 year period. An average change in rate per year would not show that there have been increases and decreases over that period. It would be better to describe the trends in the graph rather than use the average change in rate per year.

HELPFUL TIPS

3. When we look at rate we are interested in two aspects:
   - Firstly, how the output value changes – the baby's weight in our example; and
   - Secondly, how the rate of change varies – the growth rate in our example.

   The different possibilities are illustrated in the table and graph below:

Rate of change of the output value	Output value: Decreasing	Output value: Constant	Output value: Increasing
Decreasing			
Constant			
Increasing			

4. For varying rate situations, it is important to talk about trends rather than average rate.

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MATHEMATICS OLYMPIAD

CHAPTER 6

RATE – TIME – DISTANCE

1. A cheetah chases an impala. Every three leaps of the cheetah cover the same distance as two jumps of the impala, but in the time that the impala makes one jump the cheetah makes two leaps. If at the beginning of the chase the impala is twelve of his jumps ahead of the cheetah, how many jumps will the impala take before the cheetah catches him?

   (A) 36 **(B)** 24 **(C)** 6 **(D)** 12

   (E) cannot be determined.

2. You are traveling along a road at a constant speed of 105 km per hour, and you notice that you pass telephone pylons at the side of the road at regular intervals. If it takes 72 seconds to travel from the first pylon to the fifteenth, then the distance in metres between two successive pylons is:

   (A) 160 **(B)** 135 **(C)** 144 **(D)** 150 **(E)** 110

3. A train, one kilometer in length, is traveling at a constant speed of 20 km/h. At precisely 13:00 the train enters a tunnel of one kilometre in length. At what time does the end of the train leave the tunnel?

   (A) 13:01 **(B)** 13:03 **(C)** 13:06 **(D)** 13:20 **(E)** 13:40

4. If Isaac walks to school and rides his bicycle back home it takes him 90 minutes. If he rides his bicycle both ways it takes him 30 minutes. How many hours would it take him to make the trip to school and back by walking? (Assume that he walks at a constant speed and that he cycles at a constant speed.)

   (A) 2 **(B)** 2,5 **(C)** 3 **(D)** 3,5 **(E)** 4

5. Noxolo walks from her home to Bizana and back home. Her brother George walks from Bizana to their home and back to Bizana. They both walk at constant speeds (not necessarily the same). They leave at exactly the same time and meet for the f time 7 km from Bizana. Each one continues on their way to their destination wher they both turn around without any loss of time. They meet the second time 4 km from their home. The distance, in kilometers, from their home to Bizana is:

   (A) 9 **(B)** 11 **(C)** 17 **(D)** 20

   (E) impossible to tell

6. When Allan Donald bowls, the ball travels at 144 kilometers per hour. If the distar the ball travels is 20 meters then the time, in seconds, it takes is:

   (A) $\frac{1}{4}$ **(B)** $\frac{1}{3}$ **(C)** $\frac{1}{2}$ **(D)** $\frac{2}{5}$ **(E)** $\frac{2}{3}$

7. A hectare is the area of a square piece of land measuring 100 m by 100 m. Farm Jabulani bought a 45 hectare farm for R180 000. The price in rands per square meter paid by farmer Jabulani was

   (A) 4 000 **(B)** 400 **(C)** 40 **(D)** 4 **(E)** 0,40

8. Ixopo General Dealer sells fish. This can be bought in three kinds of packets:

   A 400 g packet at R10, 00 each

   A 500 g packet at R13, 00 each

   A 800 g packet at R16, 00 each.

   You want to buy 2 kg of fish, which can be done in different ways.

   The difference, in rands, between the most expensive combination and the cheap combination will be:

   (A) 10 **(B)** 12 **(C)** 8 **(D)** 4 **(E)** 14

9. Telkom plans to install 732 000 new telephone lines in the year 2000. On average the new lines will be installed at the rate of approximately

   (A) One every second **(B)** One every 5 seconds

   (C) One every 6 minutes **(D)** One every 45 seconds

   (E) One every 60 minutes

10. The postage rate for parcels is R4,10 for the first 100 g, and R1, 40 for each additional 50 g or part 50 g. The postage for a new parcel weighing 279 g is:

    (A) R9, 70 **(B)** R12, 50 **(C)** R24, 60

    (D) R9, 10 **(E)** R8, 40

11. A Peregrine Falcon migrated from Europe to South Africa in three weeks. Its average speed in km/hour was approximately

    (A) 20 **(B)** 2 **(C)** 200 **(D)** 100 **(E)** 400

12. In a supermarket a 50 ml tube of toothpaste costs R2,99 and a 100 ml tube costs R5,09. Approximately what percentage do you pay more if you buy two 50 ml tubes instead of one 100 ml tube?

    (A) 20 **(B)** 18 **(C)** 15 **(D)** 12 **(E)** 10

13. A cyclist notices that her average speed when she has covered exactly half the total distance of her race is 30 km /h. What should her average speed over the second half of the race be if she wants to finish the race with an average speed of 40 km /h?

    (A) 45 km /h **(B)** 50 km /h **(C)** 60 km /h

    (D) 54 km /h **(E)** cannot be determined from the available information

14. Ben cycles to Gamkaskloof at average speed x and returns at average speed y. his average speed for the whole trip is:

    (A) $\frac{xy}{2}$ **(B)** $\frac{x+y}{2}$ **(C)** $\frac{2x+2y}{xy}$ **(D)** $\frac{2xy}{x+y}$ **(E)** $\frac{x+y}{xy}$

15. When Michael and Ellie ran a 10 km race, Ellie won by 500 m and took 50 minutes. To give Michael a chance, the next time they raced Ellie started 500 behind the starting line. If they ran at exactly the same speeds as in the first race, then the result of the next race was

    (A) Ellie wins by 25 m **(B)** Michael wins by 20 m

    (C) they finish together **(D)** Ellie wins by 10 m

    (E) Michael wins by 15 m

16. A bricklayer would take 9 hours to build a certain wall on his own and another bricklayer would take 10 hours to build the same wall.

    If the two work together, they sometimes stop for a chat, so that they lay a total of 10 fewer bricks per hour. If it takes 5 hours to build the wall together, then the number of bricks in the wall is

    (A) 900 **(B)** 1 080 **(C)** 540 **(D)** 990 **(E)** 720

17. Four wheels with radius 6, 3, 2, and 4 respectively, are pressed together and rotat without slipping.

    If wheel A rotates at 60 revolutions per minute, then the speed of wheel B, in revolutions per minute, is

    (A) 60 **(B)** 45 **(C)** 120 **(D)** 40 **(E)** 90

With acknowledgement to The South African Maths Foundation.

ACCOUNTING GRADE 10 EXAM QUESTIONS

Question 1: Cost concepts and vat (40 marks)

1.1 Jossie Jordan inherits R8 000 from her grandmother, which she decides to use to start her own business. She receives a knitting machine as a birthday gift from her mother and decides to start a rug-making business.

During her first month of operation, September 2006, she bought wool and yarn to the value of R2 250 from a local supplier. She approaches a friend of hers, Samantha, to assist her in producing the rugs. She will pay Samantha R1 200 per month. She hires a garage from a next-door neighbour for R250 per month to produce and store her products and materials. The neighbour charges her an amount of R300 per month for electricity. She purchases plastic containers in bulk at a price of R375 for 100 containers to package each rug. She purchases an initial number of 200 plastic containers.

During her first month she produced 150 rugs, which she and her assistant sold to friends, family and the local store at a price of R65. She used all the wool and yarn but she has 50 plastic containers left over. They managed to sell all 150 rugs.

1.1.1 Explain why rent is regarded as a fixed cost and the plastic containers as a variable cost. (4)

1.1.2 Using Jossie's costs listed above, give TWO examples of fixed costs and TWO examples of variable costs, other than those mentioned in QUESTION 1.1.1. (4)

1.1.3 Calculate the total cost of producing 150 rugs including the cost of the containers. (8)

1.1.4 Calculate what it costs Jossie to produce ONE rug, including the cost of the container. (4)

1.2 Because of the overwhelmingly good response to her product, Jossie and her assistant have decided to apply for a stall at the Port Elizabeth beachfront in October 2006. This stall costs Jossie R500 per month. She also advertises in the local community newsletter at a cost of R50 per week. She estimates that she can double her production.

Jossie has hired another assistant, Peter, to manage the stall while she and Samantha manufacture the rugs. She pays Peter R1 000 per month.

After the first month Jossie does a physical count of the rugs at the stall. Jossie had given Peter 225 rugs during the course of the month. She received R11 830 from Peter for the rugs sold. The physical count shows that there are 32 rugs on hand.

1.2.1 Jossie is convinced that Peter has not accounted for all the rugs entrusted to him. (6)

1.2.2 Calculate the number of rugs that appear to be missing. (5)

In your opinion, do the costs of the stall make it worthwhile for Jossie to continue selling her rugs at the beachfront? Explain briefly. What advice would you offer her?

1.3 VAT

Jossie realises that she has paid VAT on certain items that she has purchased. She also finds out that any business of which the turnover is more than R20 000 per annum and less than R300 000 per annum, may register as a VAT vendor, however, it is not compulsory.

1.3.1 Jossie has decided to register as a tax vendor as she feels that this would allow her to charge 14% VAT on the rugs (R9,10) and that this would lead to an extra profit of R9,10 per rug. Is this correct? Explain. (5)

1.3.2 Explain why many people feel that VAT is a fair system of taxation. Provide TWO points. (4)

[40]

Question 2: Bookkeeping entries and accounting equations (50 marks)

Thando Yawa started her own business, TT Stores, selling stationery. She uses the perpetual inventory system.

Some of the transactions that occurred in May 2006, are as follows:

May	1	Thando opened a current bank account and deposited R50 000 as a capital contribution.
	4	TT Stores purchased stock on credit from TNA Stationers, R3 500. TNA Stationers also charged a delivery fee of R420 on the invoice.
	10	Returned defective stock to TNA Stationers, R255.
	15	Sold stationery on credit to N Roman, R910. The mark-up percentage on cost is 40%.
	20	Bought a computer for office use from Incredible Computers and paid by cheque, R6 500.
	22	N Roman returned stationery to the value of R336. The secret cost code used on these goods was AKB/BB. The code used by the business is BLACKHORSE where B = 0.
	25	N Roman settled her account by cheque. Allowed her 5% discount for early settlement of her account.
	27	Thando took stationery off the shop shelves for her sons to use at school. The selling price of the stationery is R315 and the cost price is R225.
	30	Settled the account of TNA Stationers by cheque.

2.1 Analyse the transactions in the answer sheet provided to reflect the ACCOUNT DEBITED, ACCOUNT CREDITED and AMOUNT. The first transaction has been done for you as an example. (35)

2.2 Name the journal and source document and show the net effect on the accounting equation for the transactions dated the 15th, 25th and 27th. The transaction on 1 May has been done for you as an example. (15)

[50]

2.1

Date	Account Debited	Account Credited	Amount
1	Bank	Capital	R50 000

(35)

2.2

Date	Journal	Source Document	A	O	L
1	Cash Receipts Journal	Receipt/Deposit slip/ Electronic transfer advice	+R50 000	+R50 000	0

(15)

ACCOUNTING GRADE 10 EXAM QUESTIONS

Question 3: Salaries, budgets and ethics (80 marks)

3.1 SALARIES

Jack Mashego owns a number of businesses, one of which is Ubuntu Security Services. He works at this business for approximately one hour per day, but he employs his brother Gary to manage the business for him. He also employs an administration assistant, Sarah Patudy, and 6 security workers.

Information on deductions and benefits:

- PAYE deductions are made from the earnings of each employee at their marginal tax rates.
- UIF deductions are made from the earnings of each employee at 1% - the employer contributes a further 1%.
- Gary belongs to a medical aid - the employer contributes on a basis of R2 for every R1 deducted.
- Both Gary and Sarah belong to a pension fund. The deduction is 7,5% of gross salary, while the employer's contribution is 10,5%.
- The security guards do not get medical aid and pension benefits.

UBUNTU SECURITY SERVICES

SALARY JOURNAL FOR SEPTEMBER 2006

Name	Gross salary	Deductions				Total deductions	Net salary
		PAYE/SITE	Medical Aid	Pension	UIF		
Sarah Patudy	3 750,00	675,00	Nil	281,25	37,50	993,75	2 756 25
Gary Mashego	12 500,00	3 125,00	1 100,00	?	?	?	?
	16 250,00	3 800,00	1 100,00	?	?	?	?

3.1.1 Explain the difference between the terms gross salary and net salary. (2)

3.1.2 Why do the security guards not appear in this journal? (2)

3.1.3 Complete Gary Mashego's payslip by filling in the missing figures and details:

PAYSLIP: GARY MASHEGO Date: Sept 2006	
Gross salary	12 500,00
PAYE deduction	– 3 125,00
Medical aid deduction	– 1 100,00
?	?
?	?
NET SALARY	?

3.1.4 Calculate the amount contributed by the employer in respect of the medical aid for Gary Mashego for the entire year. (4)

3.1.5 After negotiation with Sarah Patudy, Jack Mashego has decided to introduce the following salary scale for her with effect from 1 October 2006:

54 000 × 6 000 - 72 000 × 8 000 - 96 000 × 10 000 - 126 000

(a) What is the minimum monthly salary on this scale? (3)

(b) How long will it take Sarah to advance to the next notch? (2)

(c) Calculate the % annual salary increase that she will receive in 2016 when she reaches her maximum salary. (4)

3.2 BUDGETS AND BUSINESS ETHICS

The business hires out the services of security guards to their clients at R70 per hour. Jack Mashego has decided to increase this rate to R74 per hour for the next financial year. The security guards all work the same number of hours in a year and they are paid weekly for each hour that they work.

The security workers of Ubuntu Security Services have been on strike for the past month. They are unhappy about their working conditions and the proposed budget for 2007.

Jack and Gary have been discussing the budget for the following financial year. They already own a vehicle, which is used to transport the security guards, and they have budgeted for a new car for Jack Mashego.

It has also been decided to send Gary Mashego, the manager, to a FIVE-day conference in the USA to learn more about security measures. This trip will cost approximately R60 000.

Below is the cash budget for the year ending 30 September 2007 together with the corresponding budget and actual figures for 2006. This cash budget also indicates the % change in the budgeted figures.

UBUNTU SECURITY SERVICES

CASH BUDGET FOR YEAR ENDING 30 SEPTEMBER 2007

	2006		2007	
	BUDGET	ACTUAL	BUDGET	% CHANGE IN BUDGET
RECEIPTS				
Fee income from security services	823 200	823 200	870 240	+ 6%
Rent income	12 000	12 000	14 400	+ 20%
Interest on fixed deposit	5 000	4 000	4 320	- 13%
Loan from Sharks Lenders	50 000	50 000	70 000	+ 40%
	890 200	889 200	958 960	+ 8%
PAYMENTS				
Salary of office administrator (Sarah Patudy)	45 000	45 000	54 000	+ 20%
Salary of manager (Gary Mashego)	130 000	150 000	225 000	+ 73%
Wages of six security guards	141 120	141 120	152 410	+ 8%
Employer's contribution to medical aid, pension fund & UIF	50 236	50 236	60 009	+ 19%
Training courses for security guards	12 000	8 000	8 800	- 27%
Office telephone & electricity	20 000	16 500	16 500	- 18%
Motor vehicle running expenses	36 000	35 000	70 000	+ 94%
Interest on loan	7 000	7 000	13 200	+ 89%
Refreshments for office staff	8 400	8 500	9 000	+ 7%
Costs of Ubuntu Security Soccer Club	2 000	10 000	10 000	+ 500%
Bank charges	15 000	19 000	15 500	+ 3%
Overseas trip - conference	0	0	60 000	Not applicable
Uniforms for security guards	6 000	8 000	3 000	- 50%
Maintenance of building	18 000	14 000	19 800	+ 10%
Drawings by Jack Mashego	164 000	200 000	240 000	+ 46%
Purchase of new vehicle for Jack Mashego	0	0	340 000	Not applicable
	654 756	712 356	1 297 219	+ 98%
Cash surplus (deficit) for the year	235 444	186 844	(338 259)	
Cash in bank at beginning of year	160 075	160 075	346 919	
Cash in bank at end of year	395 519	346 919	8 660	

3.2.1 Explain what is meant by the following:

(a) Financial accounting

(b) Managerial accounting (4)

3.2.2 Why is it important for Jack to prepare a cash budget for each financial year? (3)

3.2.3 Jack also wants to prepare a code of business ethics to be displayed in the office. Briefly explain why this is a good idea and list THREE points that he should include in the code of ethics for this business. (8)

3.2.4 Was it necessary for this business to take out a loan in 2006 and to budget for an increase in the loan in 2007? Explain briefly. Provide TWO reasons for your answer. (5)

3.2.5 Gary is very happy that the salaries, wages and employer's contributions for 2006 have been well controlled. Identify THREE other operating expenses that were well controlled in the 2006 financial year and quote figures to support your opinion. (9)

3.2.6 Calculate the following for 2006:

(a) The number of hours worked by each security guard

(b) The wages that they earned per hour (8)

3.2.7 Jack wants to resolve the dispute regarding the strike as soon as possible. He approaches you for advice.

You tell him that he should meet with the guards, but that he will have to acknowledge their grievances, while stating his own point of view.

Write a report for him on:

- Points that would support his opinion
- Points that the guards are likely to raise
- Points he should consider when redrafting the budget

You will be assessed on your ability to:

- Understand Jack's perspective
- Understand the guard's perspective
- Think creatively about the budget (18)
- Identify and evaluate relevant information **[80]**

ACCOUNTING GRADE 10 EXAM QUESTIONS

Answers

Question 1

1.1

1.1.1 Explain why rent is regarded as a fixed cost and the plastic containers as a variable cost.

Rent – fixed: A fixed amount of R250 is paid each month irrespective of the number of rugs that are produced. ✓✓

Plastic containers - variable cost. The containers will vary each month depending on how many rugs are sold. ✓✓

(Any valid explanation) (4)

1.1.2 Give two examples of fixed costs and two examples of variable costs other than those mentioned in 1.1.1.

Fixed costs:

- Salary of assistant
- Electricity

Any two examples provided ✓✓

Variable costs:

- Wool
- Yarn

Any two examples provided ✓✓ (4)

1.1.3 Calculate the total cost of producing 150 rugs including the cost of the containers.

Wool and yarn	✓	R2 250
Salary: Samantha	✓	R1 200
Rent of garage	✓	R250
Electricity	✓	R300
Plastic containers	✓✓✓	R562,50
Total cost of producing rugs	☑	R4 562,50

(8)

1.1.4 **Calculate what it costs Jossie to produce 1 rug including the cost of the container.**

Cost of producing 150 rugs = R4 562,50

Therefore cost of producing 1 rug = $\frac{\text{R4 562,50}}{150}$ ✓☑ ✓

= R30,42 ☑ (4)

1.2

1.2.1 **Jossie is convinced that Peter has not accounted for all the rugs entrusted to him. Calculate the number of rugs that appear to be missing.**

225 ✓– 182 ✓✓✓ (R11 830 ÷R65) = 43 – 32 ✓ = 11 ✓ (6)

1.2.2 **In your opinion do the costs of the stall make it worthwhile for Jossie to continue selling her rugs at the beachfront? Explain briefly. What advice would you offer her?**

Yes/No ✓ Any valid explanation ✓✓

Yes: The additional costs of hiring the stall are minimal compared to the profits Jossie will make on the additional rugs sold.

More potential customers at the beachfront e.g. tourists

No: Jossie has suffered a loss due to 11 rugs gone missing or stolen from her. Sales at beachfront are seasonal depending on weather.

Advice ✓✓

Yes: Improve internal control or

No: Find another outlet that is more convenient or diversify into a different product. (5)

1.3

1.3.1 Is Jossie correct in assuming that registering for VAT would increase her profit by R9,10 per rug? Explain

This is not correct. ✓

If she registers as a VAT vendor, the R9,10 must be paid over to SARS ✓✓ and cannot be kept by Jossie. It will not increase her profits in any way. ✓✓ (5)

1.3.4 **Explain why many people feel that VAT is a fair system of taxation. Provide two points.**

Any two valid points ✓✓ ✓✓

It applies equally to all persons regardless of your income. No person is exempt from paying VAT.

Certain necessities are zero-rated or exempt.

Tourists also contribute (4)

[40]

QUESTION 2

2.1

Date	Account Dr	Account Cr	Amount
1	Bank	Capital	R50 000
4	Trading Stock ✓	Creditors' Control ✓	R3 920 ✓✓
10	Creditors' Control ✓	Trading Stock ✓	R255
15	Debtors' Control ✓	Sales ✓	R910
	Cost of Sales ✓	Trading Stock ✓	R650 ✓✓✓
20	Equipment ✓	Bank ✓	R6 500
22	Debtors' allowances ✓	Debtors' Control ✓	R336
	Trading Stock ✓	Cost of Sales ✓	R240 ✓✓
25	Bank ✓	Debtors Control ✓	R545,30 ✓✓
	Discount allowed ✓	Debtors' Control ✓	R28,70 ✓✓
27	Drawings ✓	Trading Stock ✓	R225 ✓✓
30	Creditors' Control ✓	Bank ✓	R3 245

(35)

2.2

Date	Journal	Source Document	A	O	L	
1	Cash Receipts Journal	Duplicate Receipt/ Bank deposit slip/ Electronic transfer advice	+R50 000	+R50 000	0	
15	Debtors' Journal ✓	Duplicate Invoice ✓	+R260 OR	+R260 OR	0	✓✓✓
			+R910 -R650	+R910 -R650	0	
25	Cash Receipts Journal ✓	Duplicate Receipt ✓	+R545,30 -R574	-R28,70	0	✓✓✓
27	General Journal ✓	Journal voucher ✓	-R225	-R225	0	✓✓✓

(15)

[50]

QUESTION 3

3.1

3.1.1 **Explain the difference between the terms 'gross salary' and 'net salary'.**

Gross salary is full amount before any deduction ✓

Net salary is the amount payable to the employee after deductions ✓ (2)

3.1.2 **Why do the security guards not appear in this journal?**

They earn wages and are paid on a weekly basis ✓✓ (2)

3.1.3 **Complete Gary Mashego's payslip by filling in the missing figures and details:**

PAYLSIP: GARY MASHEGO	Date: Sept 2006
Gross salary	12 500.00
PAYE deduction	– 3 125.00
Medical Aid deduction	– 1 100.00
Pension fund deduction ✓	✓✓ – 937.50
UIF deduction ✓	✓✓ – 125.00
NET SALARY	✓☑7 212.50

(8)

ACCOUNTING GRADE 10 EXAM QUESTIONS

3.1.4 **Calculate the amount contributed by the employer in respect of the Medical Aid for Gary Mashego, for the entire year.**

✓ ✓ ✓ ✓
R1 100 × 2 × 12 = R26 400 (4)

3.1.5

3.1.5.1 **What is the minimum monthly salary on this scale?**

R54 000 ✓ ÷ 12 ✓ = R4 500☑ (3)

3.1.5.2 **How long will it take Sarah to advance to the next notch?**

18 000 / 6 000 = 3 years ✓✓ (2)

3.1.5.3 **Calculate the % annual salary increase that she will receive in 2016 when she reaches her maximum salary.**

✓ ✓✓ ✓
10 000 / 116 000 × 100 = 8,6% (4)

3.2

3.2.1 **Financial Accounting**

Any reasonable explanation ✓✓

Financial Accounting deals with past financial information – uses past information to make decisions about the business.

Managerial Accounting

Any reasonable explanation ✓✓

Managerial Accounting deals with future projections of financial information – uses projections in order to make pro-active decisions about the business. (4)

3.2.2 **Why is it important for Jack Mashego to prepare a cash budget for each financial year?**

Any valid explanation, e.g.

Good management planning

Identify problems in advance

Enhance internal control over receipts and payments ✓✓✓ (3)

3.2.3 **Jack also wants to prepare a Code of Business Ethics to be displayed in the office. Briefly explain why this is a good idea, and list three points that he should include in the code of ethics for this business.**

Any valid explanations acceptable, e.g.

Reason: Any one, e.g. ✓✓

- Creates goodwill which is good for profits
- Guides the business in moral conduct - guides employers and employees in their behaviour
- Creates confidence in the business amongst stakeholders

Points for inclusion- any three valid points: ✓✓ ✓✓ ✓✓

- High level of quality service provided to customers by the employees e.g. guards must not sleep on duty
- Fair treatment of employees – good working conditions
- Accountability for decisions taken – rather than making excuses
- Integrity
- Reliability
- Professionalism
- Respect
- Confidentiality (8)

3.2.4 **Was it necessary for this business to take out a loan in 2006 and to budget for an increase in the loan in 2007? Explain briefly. Provide two reasons for your answer.**

Opinion: Yes / No ✓

Explanation – any two valid reasons✓✓ ✓✓

If YES:

- The cash at year-end is expected to be low
- There are high expenses to pay
- The loan is needed to assist in paying for the car & overseas trip

If NO:

- Wastage on unnecessary payments e.g. overseas trip, soccer club, expensive car
- Salary increases are too high – can be reduced
- His drawings are excessive and have increased significantly and are over-budget (5)

3.2.5 **Gary is very happy that the salaries, wages and employer's contributions for 2006 have been well controlled. Identify three other operating expenses that were well controlled in the 2006 financial year, and quote figures to support your opinion.**

Any three: Detail ✓ ✓ ✓ Figures ✓✓ ✓✓ ✓✓

Training – under-budget by R4 000

Telephone & electricity – under-budget by R3 500

Maintenance – under-budget by R4 000

Motor expenses – under-budget by only R1 000

Refreshments – over-budget by only R100

NB: Interest, Drawings etc are not operating expenses

(9)

3.2.6 **Calculate the number of hours worked by each security guard in 2006:**

✓ ✓ ✓ ✓
R823 200 / R70 per hour / 6 guards = 1 960 hours

Calculate the wages that they earned per hour.

✓ ✓ ☑ ☑
R141 120 / 6 guards / 1 960 hours = R12 per hour (8)

3.2.7 **REPORT FOR JACK MASHEGO REGARDING WAGE INCREASES**

THESE ARE SOME EXPECTED RESPONSES – OTHER VALID RESPONSES WILL ALSO BE ACCEPTABLE

Points that would support Jack's opinion:

- The 8% increase offered is greater than the inflation rate
- Uniforms provided
- Training provided
- Soccer club set up for employees
- The cash flow is a problem (loan was necessary)
- Overseas trip for Gary is necessary to improve the operation of the business
- He is entitled to use retained income for his own purposes

Points that the guards are likely to raise:

- Unfair treatment of categories of employees – security guards do not get MA and PF benefits
- Refreshments not provided to security guards
- Office workers receive increases of 20% (Sarah) or 73% (Gary)
- Unnecessary spending on overseas trip
- Vehicle for Jack is excessive especially as he spends very little time at the business
- Nepotism – he is giving a lucrative job to his brother.
- The huge difference between R70 and R12

Points Jack should consider in redrafting the budget:

- Equalise the remuneration increases
- Equalise the benefits e.g. employer contributions, refreshments etc
- Use one of his other businesses to finance the car
- Reduce his drawings to an acceptable amount in relation to the earnings of other stakeholders
- Repay the loan to save on interest
- Employ more security guards and expand the business (18)

[80]