

education

Department: Education **REPUBLIC OF SOUTH AFRICA**

COMMON TASK FOR ASSESSMENT (CTA) GRADE 9 – 2008

MATHEMATICS

LEARNER'S BOOK

SECTION A

CONTEXT:

Preparing for the arrival of guests during the Soccer World Cup 2010 Keeping up with the latest news

Suggested Time: 5 hours

150 marks

No of pages: 21

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SHAPES	SCALE DRAWING	DATA HANDLING
CONVERSIONS	AREA AND VOLUME	MEASUREMENT
TRANSFORMATIONS	SIMILARITY	RATIOS
PYTHAGORAS	MONEY	

ACTIVITY 1 IMPROVING A HOME FOR TOURISTS IN 2010 Work in pairs **Recommended time: 40 minutes**

A Grade 9 teenager, named Sam, agrees to help his elderly neighbour, Mr Letswalo, improve the flooring in his house. Mr Letswalo wants to rent out the spare bedroom during the Soccer World Cup in 2010 in order to raise money to send his youngest daughter to university in 2011.

He also wants to replace the old vinyl flooring in his kitchen, living-room and spare bedroom. He has to decide between rolls of vinyl and packs of vinyl tiles.



Mr Letswalo gives Sam a rough sketch of each of the rooms he wants to work in. The sketches have not been drawn to scale.



FLOOR PLAN: LIVING ROOM



Answer the following questions. Use all the above information.

- 1.1Name 4 different geometric shapes you can identify in the floor plans.(4)1.2Convert the following measurements:(1)1.2.13200 millimetres to metres(1)1.2.20,25 metres to millimetres(1)
- 1.3 Calculate the area of the floor in the following rooms in square metres:
 - 1.3.1 kitchen
 - 1.3.2 spare room and patio (3)
- 1.4 How many square centimetre tiles would be needed to cover the living room floor? (3)
- 1.5 Mr Letswalo found the following prices:



VINYL TILES	@ R19.99 PER PACK (covers 2 m ²)
JUMBO VINYL ROLLS	@ R69.99 PER ROLL (2 m x 5 m)



- 1.5.1 How many packs of vinyl floor tiles will he have to buy to cover the floor in the living room? (1)
 - 1.5.2 How many rolls of Jumbo vinyl would he need for the **same** room? (1)
- 1.6 Mr Letswalo wants to know whether he should buy the **vinyl rolls** or the **vinyl tiles to tile the living room.** How would you advise Mr Letswalo? In your answer, compare:
 - the cost of the two options
 - the dimension of the rolls and the tiles and how easily each one fits into the given space

(3)

(3)

- 1.7 Mr Letswalo would like to get rid of pests (cockroaches and fleas) with a spray called **Doom Fogger**. He reads that one can is enough for a volume of 80 cubic metres (80 m^3) .
 - 1.7.1 If the kitchen is 2,4 metres high, calculate the volume to the nearest cubic metre.
 - 1.7.2 How many cans should he buy for his house if the house has a total volume that is equal to 12 times the volume of the kitchen? (Use your answer in 1.7.1)
- 1.8 Mr Letswalo uses the triangular section (EDF) as a cooking area. The length of side DF is 1,5 m. Calculate the length of side EF (the hypotenuse) of the triangle (correct to 1 decimal place).



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(3)

(2)

(3)

[28]

(4)

(4)

ACTIVITY 2 TRANSFORMATIONS Individual exercise Recommended time: 30 minutes

- 2.1 On the first sheet of squared paper you have been given (Appendix A), draw to scale the living room floor. Let the length of each block represent 0,2 metres. (2)
- 2.2 Look at the shape drawn in the Cartesian plane below. Complete question 2.2 on the second sheet of squared paper you have been given (**Appendix B**).
 - 2.2.1 If the co-ordinates of point S are (2 ; 2), write down the co-ordinates of points P, Q and R.(3)
 - 2.2.2 Reflect shape PQRS **in the y-axis**. Label the vertices (corners) of the image of PQRS using P', Q'; R' and S', respectively.
 - 2.2.3 Now rotate the **reflected shape** (P'Q'R'S') through 90 degrees, anti-clockwise, using the origin (0; 0) as the centre of rotation. Label the vertices of the rotated shape appropriately.

(You may use tracing paper to help you.)



2.3 Mr Letswalo has the following photograph of his favourite soccer team, *Bafana Bafana*.



- 2.3.1 He wants to enlarge the photograph. He chooses a scale factor of 4. Work out the dimensions of the enlargement.
- 2.3.2 He would also like the photograph reduced in size to fit a small photo frame attached to a key ring. The reduced photograph below has an area of $9 \text{ } cm^2$.



Determine the scale factor of this reduction.

(3)

(2)

[18]

ACTIVITY 3 HIJACKING STATISTICS Individual exercise Recommended time: 25 minutes



Sam read the following article (written by John Gumede) on page 19 of the December 2007 issue of *BONA* (a local magazine). Read it carefully and answer the questions which follow:

PROTECTING YOURSELF FROM HIJACKERS

How many more must die?

According to the results of a year-long survey released in October 2005, 52% of hijackings take place in front of private residential properties, 10% happen while people are sitting in parked cars, 7% occur at traffic lights, 5% take place at business premises and 4% involve motorists being forced off the road.

In life, Lucky Dube was South Africa's Mr Reggae, the energetic performer responsible for hits such as *Prisoner, Slave Taxman and Together As One,* songs that became instant anthems among the oppressed and dispossessed. In death, he is just another statistic. Just another number crunched up and ground to dust by criminals for whom human life means nothing ...



RIP Lucky Dube – just another statistic?

3.1	Add the percentages in the article.	(1)
3.2	Calculate the percentage of hijackings that are not written about in the above article.	(1)
3.3	Draw a bar graph to represent the information on where hijackings occur. (Use all percentage data.) Give it a meaningful heading and label the axes clearly.	(6)
3.4	What type of hijacking occurs most frequently?	(1)
3.5	Mr Letswalo has been coming home late after work. Sam writes a short note to him to warn him. What do you think he said in his note? Write only $2 - 4$ lines.	(2)
		[11]

MONEY

TASK 2



DATA HANDLING ROUNDING GRAPHS

OPERATIONS FORMULAE PERCENTAGES

ACTIVITY 1 PROFIT-MAKING Work in pairs **Recommended time: 30 minutes**



Mr Letswalo's wife offers to prepare a meal for 51 visiting Church Ministers, and use the profit to help pay for the improvements to her house. She decides to cook a fish and pasta (noodles) dish by using the Glenryck Pilchard Lasagne recipe below:

The recipe is for 6 people:



1.1 Convert the following:

	1.1.1 250 g to kilograms	(1)
	1.1.2 200 ml to litres	(1)
1.2	The recipe is for 6 people and needs to be adjusted for 51 people. Calculate how many:	
	1.2.1 tins of Pilchards she should buy.	(3)
	1.2.2 kilograms of noodles she should buy.	(3)
1.3	If mushrooms are selling for R10,99 per kilogram in the shops, how much will 125 g of mushrooms cost? Round off your answer to the nearest cent.	(3)
1.4	If the cost for 6 people is R50. Determine the cost for 51 people.	(3)
1.5	If the Church pays Lola the cost price of the meal plus 50% extra, determine how much profit she will make. Use your answer in (1.4) to calculate her profit.	(2)
		[16]

ACTIVITY 2 SELLING MUFFINS Work in small groups Recommended time: 80 minutes

Susan is a soccer fan. She sends out a questionnaire to the members of her community to find out if it would be worth raising funds for a big screen TV for the Community Centre Hall, so that families without a TV can watch the FIFA Soccer World Cup in 2010.

She and 4 classmates plan to sell muffins (cakes) every week until they have raised enough money to buy a PANASONIC TV with a 74 cm screen, which costs **R2 299** (Makro Store Advert - 8 January 2008).

- 2.1 Write down one question Susan might have used in her questionnaire. (Read up on how to set questions for a questionnaire.) (1)
 2.2 Draw a picture of a TV screen and on it *draw a line* to show what you understand by the words 'a 74 cm screen'. (1)
- 2.3 Susan finds a recipe for Cherry Muffins. It costs R43,75 to bake 25 muffins. Calculate the cost per muffin.
- 2.4 Susan and her friends plan to sell 50 muffins every week.
 - 2.4.1 Copy and complete the following table:

	1	and i
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-	pr -	-
		off
	atter the	

4.0 117.1

NUMBER OF WEEKS	x	1	2	4	10	40
TOTAL NUMBER OF MUFFINS	у	50			500	

	2.4.2	Write down an equation to show the relationship between x and y.	(2)
	2.4.3	Is this an example of direct or indirect (inverse) proportion? Give a reason for your answer.	(2)
	2.4.4	On the set of axes supplied (Appendix C) draw a graph to show the relationship between x and y from the table in 2.4.1. Use a suitable scale.	(4)
	2.4.5	<i>Use your graph</i> to determine how many muffins would have been sold by the end of the 25 th week and mark with an A where you read off this answer.	(2)
2.5	How they d	many muffins will they have to sell to make enough money to buy the TV if ecide to sell the muffins for 50 cents more than the cost price?	(2)
2.6	How 1	nuch will it cost to make the number of muffins calculated in question 2.5?	(2)



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(3)

^

(2)

2.8

2.7 Susan and her 4 friends agree to take turns to bake and sell the muffins. Each week one of them will bake and sell 50 muffins.

2.7.	1 How long will it take to raise enough money to buy the TV?	(2)
2.7.	2 How often will each person in the team have to bake and sell 50 muffins?	(2)
Des sho	ign a poster advertising the Profit-Making Plan. It must be A4 in size and it uld meet the following criteria.	
•	It should show the date on which the muffins will be sold and where the muffins will be sold.	(2)
•	It should also give the price of the muffins and details of how to order or buy the muffins.	(2)
•	It should briefly describe the reason for the fundraising effort. You should include a picture of the muffins and the TV.	(2)
•	It should be easy to read and understand. It should be eye-catching.	(2)
		[33]

TASK 3

DATA HANDLING

FORMULAE

EXCHANGE RATES

ACTIVITY 1 MATRIC RESULTS 2006/ 2007 Work in pairs

Recommended time: 35 minutes

Mr and Mrs Letswalo, who live in Mpumalanga, wonder how well their daughter, Maria, will do when she writes her Grade 12 exams in 2010. They have another look at the 2007 results published in the local newspaper, *THE WITNESS*, on 28 December 2007. Unfortunately, a cup of coffee was spilled over the newspaper making it difficult to read some of the information.

HARD WORK IS WHAT IT TAKES								
Table showing pass rates per province in 2006 and 2007								
	D		2006	•		2007		
	Province	No of candidates	No of passes	% passes	No of candidates	No of passes	% passes	
1	Eastern Cape	69 561	41 268	?	69 158	39 358	56,9	
2	Free State	29 884	21 580	72,2	30 559	21 522	70,4	
3	Gauteng	73 216	57 355	78,3	84 822	63 287	74,6	
4	Kwazulu-Natal	125 777	82 460	65,6	148 093	94 421	63,8	
5	Limpopo	105 775	58 850	55,6	96 490	55 850	57,9	
6	Mpumalanga	39 040	?	65,3	51 787	31 449	60,7	
7	North West	37 953	25 440	67,0	31 786	21 372	67,2	
8	Northern Cape	7 495	5 753	76,8	10 158	7 141	70,3	
9	Western Cape	?	33 316	83,7	41 922	33 787	80,6	

Investigate the trend in the matric pass rate (%) by determining the following:

1.1	the pass rate in percentage in the Eastern Cape	(2)
1.2	number of passes in Mpumalanga	(2)
1.3	the mean percentage passes in 2006 and 2007 (to the nearest whole percentage).	(3)
1.4	In 2007 in Mpumulanga, 31 449 pupils passed, while in the Free State, 21 522 pupils passed. Why is the percentage lower in Mpumalanga if they had more pupils who passed than the Free State?	(1)
1.5	On the set of axes supplied (Appendix D) draw a scattergraph to show the relationship between the % passes in 2006 and 2007 for each province. (The percentages can be rounded to the nearest percent for this exercise.)	(4)
1.6	What does the scattergraph tell you?	(1)
1.7	Using your answers to questions 1.1 to 1.6 above, say whether it is possible to predict the pass rate in Mpumalanga and the rest of South Africa in 2010. Record your findings in the form of a short report.	(3)

[16]

ACTIVITY 2 SOCCER NEWS: PROFESSIONAL SOCCER LEAGUE (PSL) Group exercise Recommended time: 30 minutes

Study the following soccer statistics, taken from the *SUNDAY TIMES* on 9 December 2007, and then answer the questions that follow:

- Key: P games played
 - W games won
 - **D** games drawn (same score)
 - A goals scored against the team





L

F

- FC Football Club
 - games lost
 - goals for the team
- Pts points scored



	Club	Р	W	D	L	F	Α	Pts
1	Ajax Cape Town	12	7	3	2	17	8	24
2	Free State Stars	11	6	3	2	16	10	21
3	Pirates	12	6	1	5	18	15	19
4	Arrows	12	5	4	3	13	11	19
5	Wits	12	5	4	3	13	14	19
6	Supersport United	12	5	3	4	12	11	18
7	Bloem Celtic	11	5	2	4	9	10	17
8	Amazulu	11	4	3	4	9	9	15
9	Sundowns	12	3	5	4	16	16	14
10	Swallows	11	3	4	4	10	15	13
11	Chiefs	11	2	6	3	10	8	12
12	Leopards	11	4	0	7	11	12	12
13	Cosmos	12	2	6	4	9	12	12
14	Santos	11	2	5	4	8	11	11
15	Platinum Stars	11	2	5	4	8	12	11
16	Royal Zulu FC	11	2	3	6	11	15	9

RULES for the above soccer tournament:

- The competition is played on a round-robin basis, i.e. every team will play every other team. In a league format, two rounds are played. This means that every team will play 30 matches.
- Teams are awarded
 - (a) 3 points for a win
 - (b) 1 point for a draw
 - (c) no points for a lose
- The team with the most number of points, at any stage, will lead the competition; or at the completion of the two rounds, this team will win the competition.

- If two teams have the same number of points, the team with the higher **points-differential** will occupy the higher position on the log. The points-differential is the difference between the number of GOALS FOR and GOALS AGAINST.
- If two teams have the same number of points and they have the same pointsdifferential, they will share the trophy.
- 2.1 The total points (**T**) in the table below have been calculated using the W and D values. Sam investigates the points calculation by looking first at the teams that have played 12 games:



D 3 1 4 4 3 5 6 T 24 19 19 19 18 14 12	\mathcal{A}	W	7	6	5	5	5	3	2	
T 24 19 19 19 18 14 12	\mathbf{Y}	D	3	1	4	4	3	5	6	
		Т	24	19	19	19	18	14	12	

- 2.1.1 Write (in words) a formula for calculating the points scored (T) using the information in the **W** and **D** rows.
- 2.1.2 Now write a formula for the **T** in terms of **W** and **D**. Write it in the form $\mathbf{T} = \dots$ (1)
- 2.2 Use your formula or another method to work out the points a team would have gained had they won 9 games and drawn 2 games.

2.3

- 2.3.1 Sam tries to work out whether or not Free State Stars will move to the top of the league table if they win their next game. Discuss. (3)
- 2.3.2 In a certain game between the Kaizer Chiefs and Orlando Pirates, the final score was 3 2. How many different scorelines were possible at half-time in this match?
- 2.4 Consider the following exchange rate:

1 US Dollar = R6,68

If each soccer player is paid R10 000 per game. Convert this amount to Zimbabwean Dollars (Z\$) if:

Z\$ 30 000 = 1 US Dollar (3)

[14]

(2)

(2)

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ACTIVITY 3 MISLEADING INFORMATION Individual exercise Recommended time: 15 minutes

The following table appeared in the December 2007 issue of the magazine **DESTINY**.

TV Programme (Soapie)	Number of Viewers (in millions)
Generations	4,2
The Bold and the Beautiful	2,8
Muvhango	2,6
7de Laan	2,4
Days of Our Lives	2,9

Two grade 9 learners, Thando and John, represented the information in the table as follows.



3.1 Are the above graphs GOOD representations of the data in the given table? Comment on both graphs.(Do you think one is better than the other? Give a reason.)

[4]

ACTIVITY 4 PROBABILITY Individual exercise Recommended time: 15 minutes

Each player in a certain soccer team is given 4 jerseys to wear to practices: a red one, a green one, a white one and a yellow one. They are also given a bag in which to keep the jerseys. A player reaches into his bag (without looking) and pulls out a jersey. He does **NOT** replace the jersey. He reaches into the bag again and pulls out another one (again, without looking).



4.1 Complete the following tree diagram to show the possible outcomes. (A copy is provided as **Appendix E**):



- 4.2 Determine the probability of choosing a white jersey first and then a green jersey. (2)
- 4.3 Calculate the probability of choosing a red and a yellow jersey, in any order. (2)
- 4.4 What is the probability of choosing a yellow jersey with any other colour jersey, in any order? (2)

[10]

(4)

Total: 150 marks

APPENDIX A

TASK 1ACTIVITY 2.1

(Scale Drawing)



APPENDIX B

TASK 1ACTIVITY 2.2

(Transformations)



APPENDIX C

TASK 2 ACTIVITY 2.4.4

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(Straight line graph)



TASK 3ACTIVITY 1.5

(Scattergraph)



APPENDIX E

Task 3ACTIVITY 4.1



(Tree Diagram)

