



**education**

Department:  
Education  
REPUBLIC OF SOUTH AFRICA

# **MATHEMATICS**

**Common Tasks for Assessment (CTA)**

**PART 1**

**Grade 9**

**2007**

**TEACHER'S GUIDE**

 **No. Pages: 13**

# PART 1: TEACHER'S GUIDE


## NOTE TO TEACHERS:


Teachers must not only look at the final answers. Marks should be awarded for the correct reasoning processes.

**HINT:** Where it is necessary, read the activity and its related questions to learners at the start of an activity, drawing their attention to the formulae and/or to guide some of the learners through the formulae by showing them the process to follow in describing these formulae in words while not working with the actual numbers.

## SUMMARY OF TASKS AND ACTIVITIES

Tasks	LOs addressed	Time Allocation	Mark Allocation	Forms of assessment	Assessment Peer; Group; Self; Teacher	Resources (if available)
1. Understanding the telecommunications industry	LO1 LO2	85 minutes	35	Assignment	Group; Pairs; Individual;	Calculator Graph paper
2. The world is the limit – if the world knows about you	LO1 LO3 LO4	95 minutes	31	Classwork	Group; Individual	
3. Delivering on the proposal	LO1 LO2 LO3 LO4 LO5	60 minutes	26	Assignment	Individual; Pairs	Calculator
4. A bright future	LO1 LO2 LO4 LO5	60 minutes	28	Classwork	Individual; Pairs; Individual	Calculator
		<b>5 hours</b>	<b>120 marks</b>			

 Activity 1.1		
<b>CLASS DISCUSSION</b> Let the groups make a list of the benefits and negative effects advantages and disadvantages. Put it on the wall for all to see and discuss.		<b>LO</b>
1.1.1	They have become cheaper and fairly easily accessible. So, anyone can own a cell phone.	No marks
1.1.2	<b>BENEFITS</b> 1. It is now easier to get in contact with relatives, far and near, in case of an emergency 2. Parents can keep contact with their child-minders whilst they are away.	
1.1.3	<b>POSSIBLE NEGATIVE EFFECTS</b> 1. Children may not give themselves enough time for their studies, spending too much time in chat-rooms 2. Exposure to immoral sites on the Net through their cell phones 3. A driver can lose control of their car whilst speaking on the phone.	

 Activity 1.2				<b>LO</b>												
1.2.1	$\begin{array}{l} D_{\text{PRCs2}} : D_{\text{PRCs1}} \\ = 560 : 240 \\ = 70 : 3 \end{array}$	Calculate the ratio of distances	1 mark	1												
1.2.2	$\begin{array}{l} C_{\text{PRCs2}} : C_{\text{PRCs1}} \\ = 9\,800\,000 : 500\,000 \\ = 98 : 5 \end{array}$	Calculate the ratio of costs	1 mark	1												
1.2.3	Any good reason eg. the towers must overlap over a distance of 460km. The PRCs2 are much more expensive and you can save by using a PRCs1.	Reason	1 mark	1												
1.2.4	<p>PRCs1 = x and PRCs2 = y (460km ÷ 56 = 8,2 to get the approximate number of large towers.)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>y</td> <td>8</td> <td>448km</td> </tr> <tr> <td>x</td> <td>5</td> <td>12 km</td> </tr> <tr> <td colspan="2">Distance covered</td> <td>460km</td> </tr> <tr> <td colspan="2">Total cost</td> <td>R80,9mil</td> </tr> </table> <p>The combination will be 5 smaller and 8 bigger towers.</p>	y	8	448km	x	5	12 km	Distance covered		460km	Total cost		R80,9mil	The learner may use any method to reach this answer – set up a table or any other method.	4 marks	2
y	8	448km														
x	5	12 km														
Distance covered		460km														
Total cost		R80,9mil														



Activity 1.3

				<b>LO</b>																						
1.3.1	$C = 3\,520 + 250(10)$ $= R6\,020$	Correct substitution and answer	1 mark	2																						
1.3.2	$C = 2\,600 + 480t$ $5\,960 = 2\,600 + 480t$ $480t = 3\,360$ $t = 7$ It will take 7 days.	Correct substitution and answer	1 mark	2																						
1.3.3	$2\,600 + 480t = 3\,520 + 250t$ $230t = 920$ $t = 4$ This job will take 4 days	Equations equal Correct calculation Correct answer	1 mark 1 mark 1 mark	2																						
1.3.4	<div style="text-align: center;"> <p><b>Quotes by the two companies</b></p> <table border="1" style="margin: 10px auto;"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>● Company A</td> <td>3770</td> <td>4020</td> <td>4270</td> <td>4520</td> <td>4770</td> <td>5020</td> </tr> <tr> <td>■ Company B</td> <td>3080</td> <td>3560</td> <td>4040</td> <td>4520</td> <td>5000</td> <td>5480</td> </tr> </table> </div>				1	2	3	4	5	6	● Company A	3770	4020	4270	4520	4770	5020	■ Company B	3080	3560	4040	4520	5000	5480		
	1	2	3	4	5	6																				
● Company A	3770	4020	4270	4520	4770	5020																				
■ Company B	3080	3560	4040	4520	5000	5480																				
	Heading for graph (learner's own) Axes have appropriate scale Plot points correctly		1 mark 1 mark 3 marks																							
1.3.5	See graph	Point of intersection	1 mark	2																						
1.3.6	$6\,854 - 5\,960 = 894$ $\frac{894}{5960} \times \frac{100}{1} = 15\%$ OR $\frac{6854}{5960} \times \frac{100}{1} = 15\%$  $\therefore$ % increase is 15%  A reason, eg. labour must be paid double over a long weekend, etc.	Calculate percentage correctly   Reason	1 mark   1 mark	2																						



## Activity 1.4

				<b>LO</b>
1.4.1.1	$R64.50 \times 24 \text{ months} + R102$ connection fees $= R1650$	Correct answer	1 mark	1
1.4.1.2	Package 1 = R64,50/month Package 2 = R968 $= \frac{968}{64,5}$ $= 15$ $\therefore 15 \text{ months}$	Finding the correct values and dividing correctly  Correct answer	1 mark  1 mark <b>2 marks</b>	1
1.4.2	Package 2	Correct answer	1 mark	1
1.4.3	Package 2 will be cheaper. Anything that you pay for in cash will always be cheaper.	Learner's answer (they must give a reason)	2 marks	1



## Activity 1.5

				<b>LO</b>				
1.5.1	<table border="1"> <tr> <td>Number of call units</td> <td>20</td> </tr> <tr> <td>Cost</td> <td>154</td> </tr> </table>	Number of call units	20	Cost	154	Correct answer	1 mark	2
Number of call units	20							
Cost	154							
1.5.2	Cost for 5 units is R7,50. Therefore the cost for 1 unit is R1,50	Learner's own estimation – approximately R1,50	2 marks	2				
1.5.3	The monthly rental is R124	Correct answer	1 mark	2				
1.5.4	The cost is calculated by adding the number of units used multiplied by the rate per unit to the monthly rental, which is a flat rate.	Learner's answer	2 marks	2				
1.5.5	$C = \frac{3}{2}x + 124$	Correct answer	2 marks	2				

TASK **2**

**THE WORLD IS THE LIMIT – IF THE WORLD KNOWS ABOUT YOU**



Activity 2.1

2.1	<b>CLASS DISCUSSION</b>	<b>LO</b>
	<p>Let the groups come up with definitions of the word “billboard”. It may be a good idea to let them bring cardboard, newspaper/magazine cuttings of advertised products in telecommunications. E.g. cell phones</p> <p>2.1.2 and 2.1.3 may be good topics for a debate.</p> <p><b>NOTE:</b> No mark allocation for the class discussion.</p>	



Activity 2.2

2.2.1				<b>LO</b>
	$12,2 \times 20,6 + 20,6 \times 20,6 + 16,6 \times 20,6 + 2 \left( \frac{1}{2} \times 20,6 \times 10 \right)$ $= 1223,64 \text{m}^2$	<p>Correct net</p> <p>Correct calculation</p> <p>Correct answer (unit included)</p>	<p>1 mark</p> <p>2 marks</p> <p>1 mark</p>	
2.2.2	$\frac{799,20}{1223,64} \times \frac{100}{1}$ $= 65,32\%$	<p>If learner realizes that only the top must be painted</p> <p>Correct answer</p>	<p>1 mark</p> <p>1 mark</p>	1
2.2.3	$799,28 \text{m}^2 \div 90 \text{m}^2 = 8,88$ <p>But paint is not sold in 0,881 tins therefore they need 9 tins</p> <p>Cost = 9 x R580 = R5 220</p>	<p>Calculate number of tins</p> <p>Rounding of to 9 tins</p> <p>Correct answer</p>	<p>1 mark</p> <p>1 mark</p> <p>2 marks</p>	1





Activity 2.4

2.4	<b>LEARNER'S OWN DESIGN</b>		<b>LO</b>
	Correct use of three transformations	3 marks	3
	General design and colours of national flag	1 mark	



				<b>LO</b>
3.2.1	$V = l \times b \times h$ $= x(x+4)(x-3)$ $= x(x^2+x-12)$ $= x^3 + x^2 - 12x$	Correct formula 1 mark Correct substitution into formula 1 mark Correct calculation 1 mark Correct answer 1 mark	4 marks	2,4
3.2.2	$(3x^2 - 27) \text{ cm}^2$ $= 3(x^2 - 9)$ $= 3(x + 3)(x - 3)$ <p><math>\therefore</math> the breadth of the piece of leather is <math>3(x - 3)</math></p>	Take out common factor Correct factorization  Correct answer	1 mark 1 mark  1 mark	2,4
3.2.3	a) $V = l \times b \times h$ $\therefore h = \frac{V}{l \times b}$ $= \frac{59,5}{8,5 \times 2}$ $= 3,5 \text{ cm}$	Correct substitution Correct answer	1 mark 2 marks	4
	b) $V = l \times b \times h$ $= 8 \times 1,5 \times 3$ $= 36 \text{ cm}^3$	Correct answer	2 marks	4
	c) Rectangular prism__Cuboid.	Correct answers	2 marks	3



### Activity 3.3

				<b>LO</b>
3.3	Quote for 10 000 phones: $R846 \times 10\,000 \div 7,05$ $= \$1\,200\,000 \text{ or } \$1,2 \text{ million}$	$R846 \times 10\,000$ Conversion to dollars	2 marks 2 marks	1



## Activity 4.1

			<b>LO</b>	
4.1.1			2,4, 5	
	Scatter graph	Heading for the graph Naming the axis Correct scale on the axis (work with the learner's scale) Dots	1 mark 1 mark 1 mark 2 marks	5
4.1.2	See graph  The number of users increased rapidly after 1998.	Line of best fit (learner's own) Conclusion	1 mark  1 mark	5
4.1.3	$y = mx + c$	Correct answer	1 mark	2
4.1.4	$m = \frac{13,34 - 1,34}{2004 - 1999}$ $= \frac{12}{5}$	Correct substitution  Correct answer	1 mark  2 marks	2
4.1.5	$y = \frac{12}{5}x - 8$ $= 2,4(15) - 8$ $= 28$ The estimated number of users will be 28 million	Correct substitution  Correct answer	1 mark  1 mark	2



### Activity 4.2

				<b>LO</b>
4.2	January will be the best choice because the mean monthly rainfall is very low and the daily temperatures are very high. February, December and March will also be good choices. The province must be the Western Cape. It is the only province with such high rainfall figures in winter.	Correct answer – January Reason Other months  Note: No marks for the question on the province – this question links with SS.	1 mark 1 mark 1 mark	5



### Activity 4.3

				<b>LO</b>
4.3.1	April, May, July, August.	Correct answer	2 marks	5
4.3.2	25 <sup>0</sup> C	Correct answer	2 marks	5
4.3.3	The range is the difference between the highest and the lowest observed values. Highest temperature = 25 <sup>0</sup> C Lowest temperature = 15 <sup>0</sup> C Range = 25 <sup>0</sup> C - 15 <sup>0</sup> C = 10 <sup>0</sup> C	Correct explanation Correct answer	1 mark 1 mark	5



#### Activity 4.4

				<b>LO</b>
4.4.1	The values depicted in the graphs are exactly the same.	Any other believable answers	1 mark	5
4.4.2	The scales are not the same. The bars are not of the same dimensions.	Any other believable answers	1 mark	5
4.4.3	Graph A, because it creates the impression that the growth in turnover is very high.	Any other believable answers	1 marks	5



#### Activity 4.5

				<b>LO</b>
4.5.1	10 560	Correct answer	1 mark	5
4.5.2	$10 \times R5\ 000 + 50 \times R1\ 000 + 500 \times R100 + 10\ 000 \times 5$ $= R200\ 000$	Correct answer	1 mark	5
4.5.3	$\frac{10560}{100000} = \frac{33}{3125}$	Correct answer	2 marks	5

**TOTAL: 120 marks**