

ISEBE LEMFUNDO LEMPUMA KOLONI
EASTERN CAPE EDUCATION DEPARTMENT
OOS-KAAP ONDERWYSDEPARTEMENT

IIMVIWO ZEBANGA LESHUMI ELINANYE
GRADE 11-EXAMINATIONS
GRAAD 11-EKSAMEN

NOVEMBER 2008

MATHEMATICS – THIRD PAPER

IXESHA: 2 iiyure
AMANQAKU: 100

TIME: 2 hours
MARKS: 100

TYD: 2 uur
PUNTE: 100

Write on the cover of your answer book, after the word "Subject" –
MATHEMATICS – THIRD PAPER

This question paper consists of 9 pages, a diagram sheet and a formula sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of EIGHT questions. Answer ALL the questions.
2. Show clearly ALL calculations, diagrams, graphs, and etcetera which you have used in determining the answers.
3. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
4. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Diagrams are NOT necessarily drawn to scale.
7. It is in your own interest to write legibly and to present the work neatly.
8. An information sheet with formulae is attached.

QUESTION 1

- 1.1 In a certain school, both the learners and the educators agreed on a new school uniform. A survey was conducted. 35% (0,35) of the respondents said they prefer a blue colour, 75% (0,75) said they prefer a maroon colour, and 20% (0,20) said a combination of blue and maroon is also acceptable.
- 1.1.1 Draw a Venn diagram to represent the above information. (2)
- 1.1.2 Are the two events independent or statistically dependent? Explain your answer. (2)
- 1.2 A and B are mutually exclusive events. $P(A) = 0,4$ and $P(A \text{ or } B) = 0,9$. Calculate $P(B)$. (2)
- 1.3 A survey was conducted in a restaurant about the diet preference of clients eating lunch on a Sunday afternoon. The table below shows their diet preferences.

	MALES	FEMALES	TOTAL
VEGETARIANS	a	70	110
NON-VEGETARIANS	10	b	90
TOTAL	c	150	d

- 1.3.1 Calculate the values of (a, b, c and d) in the table. (2)
- 1.3.2 Is a person's preference for a particular diet independent of the person's gender? Support your answer with appropriate calculations. (4)
- [12]**

QUESTION 2

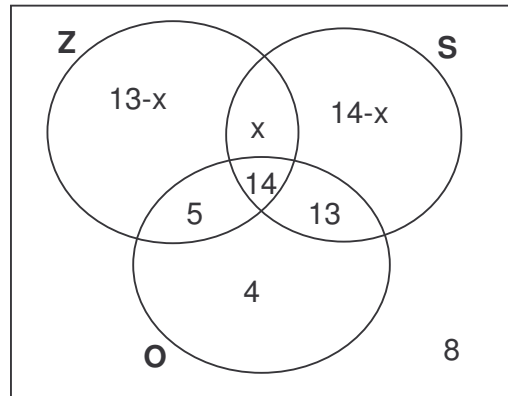
Ayanda won a travelling voucher. He decided to visit the following three places in the Eastern Cape, namely, Shamwari Nature Reserve, Wild Coast Sun and the Oceanarium in Port Elizabeth. He did not plan his travelling route, but will visit each of the places at random.

- 2.1 Draw a tree diagram to present all the possible combinations of the order of visits. (4)
- 2.2 What is the probability that:
- 2.2.1 Ayanda will visit the Wild Coast Sun first? (2)
- 2.2.2 Ayanda will visit the Wild Coast Sun first and Shamwari Nature Reserve second? (2)
- 2.2.3 Ayanda will visit the Oceanarium in Port Elizabeth first, the Wild Coast Sun second and the Shamwari Nature Reserve third? (2)

[10]

QUESTION 3

Sixty eight learners in a certain age group visit a zoo, snake park and oceanarium.
 Suppose $Z = \{\text{zoo}\}$, $S = \{\text{snake park}\}$ and $O = \{\text{oceanarium}\}$.
 The information gathered is shown in a Venn diagram.

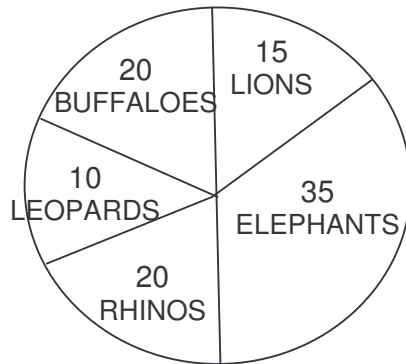


- 3.1 Determine the value of x . (3)
- 3.2 How many learners did not visit any of the places? (1)
- 3.3 How many learners visited the zoo or the oceanarium, but not the snake park? (2)
- 3.4 What is the probability that a learner will only visit one place? (3)
- 3.5 Calculate the percentage of learners that visited at least two places. (Round your answers off to ONE decimal place). (3)

[12]

QUESTION 4

- 4.1 The Kruger National Park has a population of 2400 for the big five. During a day tour through the park, 100 of these animals were spotted. The pie chart below shows how many of each was spotted.



- 4.1.1 Use the information above to predict the total number of elephants in the park. (2)
- 4.1.2 Is the prediction accurate? Give a reason for your answer. (3)
- [5]**

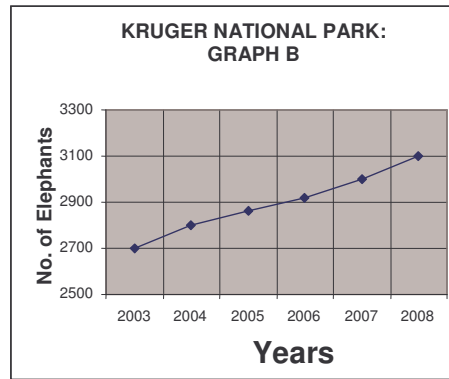
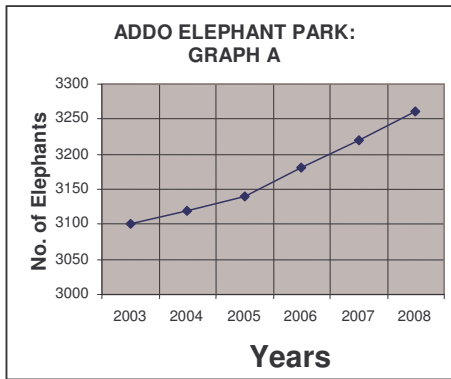
QUESTION 5

The number of elephants in the Addo Elephant Park and Kruger National Park for the past six years is shown below:

YEAR →	2003	2004	2005	2006	2007	2008
ADDO	3100	3120	3140	3180	3219	3260
KRUGER	2700	2802	2860	2920	3000	3100

- 5.1 Refer to the table above and determine which park had a better average growth rate between 2004 and 2007? Show all calculations. (3)
- 5.2 Compare the growth rate of the two parks between 2004 and 2007 by determining the ratio of the Kruger growth rate to the Addo growth rate. (2)

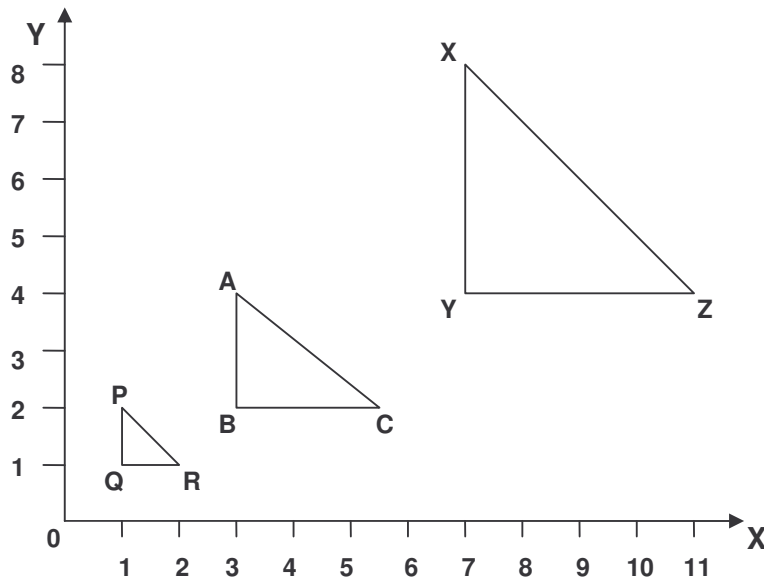
- 5.3 The graph below shows the growth rate of the elephant population in the Addo Elephant Park and Kruger National Park.



- 5.3.1 Which graph seems to show a greater growth rate? (1)
- 5.3.2 Is the answer in QUESTION 5.3.1 a true reflection of the actual growth rate? Explain. (2)
- 5.3.3 Explain how this perception is created. (2)
- [10]

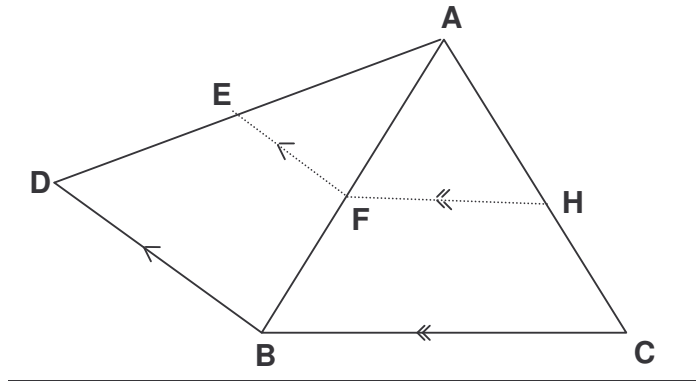
QUESTION 6

- 6.1 Refer to the diagram below and the question that follow.



- Which triangle ($\triangle ABC$ or $\triangle XYZ$) is similar to $\triangle PQR$? Give a reason. (3)

6.2 In $\triangle ACB$, $FH \parallel BC$ and in $\triangle ABD$, $FE \parallel BD$ with :
 $AH = 36$ mm, $HC = 16$ mm, $AF = 27$ mm and $FB = x$ mm.

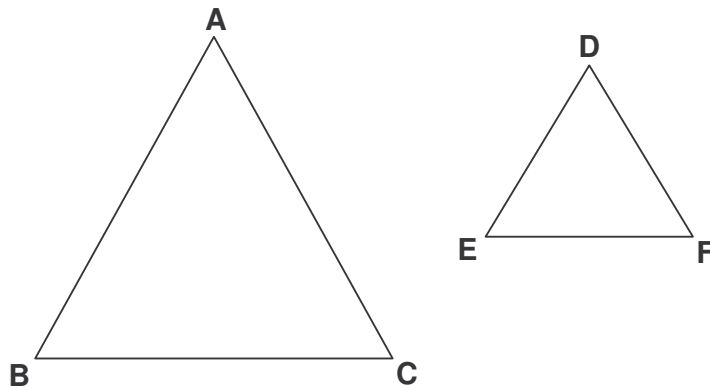


- 6.2.1 Calculate the value of x . (4)
 - 6.2.2 Determine $DE : EA$ (1)
 - 6.2.3 If $FH = 45$ mm, prove that $\triangle ABC$ is a right-angled triangle. (7)
- [15]

QUESTION 7

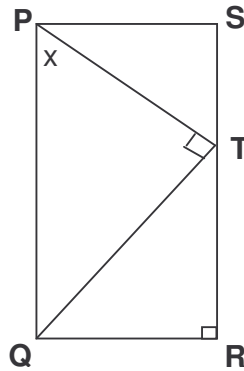
7.1 In the diagram below $\triangle ABC$ and $\triangle DEF$ are two triangles such that $\hat{A} = \hat{D}$, $\hat{B} = \hat{E}$ and $\hat{C} = \hat{F}$. Use the diagram on the DIAGRAM SHEET to prove the theorem which states that:

$$\text{if } \hat{A} = \hat{D} \text{ and } \hat{B} = \hat{E} \text{ then } \frac{AB}{DE} = \frac{AC}{DF}.$$



(7)

7.2 In the figure, PQRS is a rectangle, T is a point on RS such that $\hat{PTQ} = 90^\circ$.



7.2.1 If $\hat{QPT} = x$, determine, with reasons, each of the following angles in terms of x :

- (a) \hat{PTS} (2)
- (b) \hat{TQR} (3)

7.2.2 Prove that $\triangle PTQ \sim \triangle QRT$ and hence deduce that $QT^2 = TR \cdot PQ$ (4)

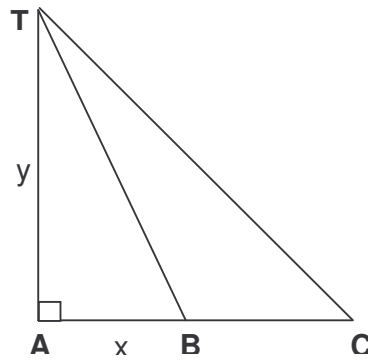
7.2.3 Name another triangle similar to $\triangle PTQ$ and hence prove that $TP^2 = ST \cdot PQ$ (2)

7.2.4 If $ST:TR = 1:4$, determine the ratio $QT:TP$ (4)

[22]

QUESTION 8

8.1 In the diagram below $\triangle TAC$ is given with $\hat{A} = 90^\circ$ and $AB = BC$.



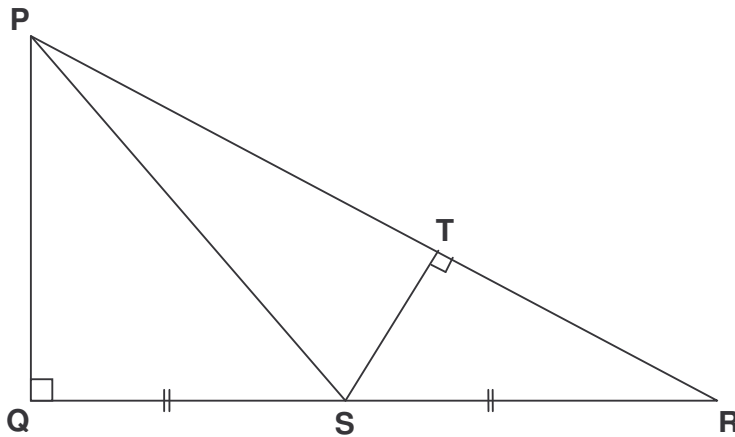
Let $AB = x$, $TA = y$ and then express:

8.1.1 TC^2 in terms of x and y . (3)

8.1.2 TB^2 in terms of x and y . (1)

8.1.3 $TC^2 - TB^2$ in terms of x . (2)

8.2 In the figure below $QS = SR$, $\hat{PQR} = \hat{STR} = 90^\circ$



Prove that:

8.2.1 $PT^2 + QS^2 = PS^2 + TR^2$ (4)

8.2.2 $\triangle PQR \sim \triangle STR$ (3)

8.2.3 $PR \cdot TR = SR \cdot QR$ (1)

[14]

GRAND TOTAL: 100