



Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

JUNE 2010

MATHEMATICS

MARKS: 100

TIME: 2 hours

This question paper consists of 13 pages.

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Write neatly and legibly.
3. Do not change the numbering of the questions.
4. Show all your calculations, where necessary.
5. A non- programmable calculator may be used.

SECTION A

In this section, write only the correct LETTER next to the corresponding question number:

1. $3x^3y^2(6x^2y) = \dots$

- A. $18x^6y^3$
- B. $9x^5y$
- C. $18x^6y^2$
- D. $18x^5y^3$

(1)

2. Which of the following statements is INCORRECT?

- A. $\sqrt{8}$ is an irrational number
- B. $0,33 = \frac{1}{3}$
- C. $5^2 = 10$
- D. $\frac{-4}{5}$ is a rational number

(1)

3. $a^2 - 25 =$

- A. $(a+25)(a+1)$
- B. $(a-5)(a+5)$
- C. $(5-a)(5+a)$
- D. $5a(a-5)$

(1)

4. Study the table below and choose the correct value of a and b

1	2	3	4	...	12
-4	1	6	a	...	b

- A. $a = 8$ and $b = 24$
- B. $a = 30$ and $b = 51$
- C. $a = 11$ and $b = 51$
- D. $a = 11$ and $b = 41$

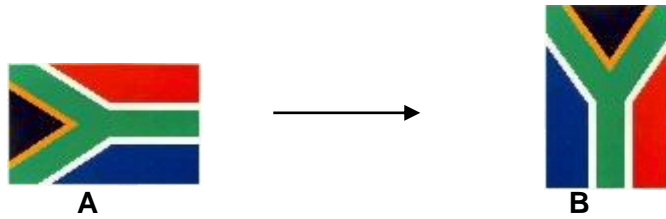
(2)

5. 7^{2008} has the last digit as ...

- A. 1.
- B. 3.
- C. 7.
- D. 9.

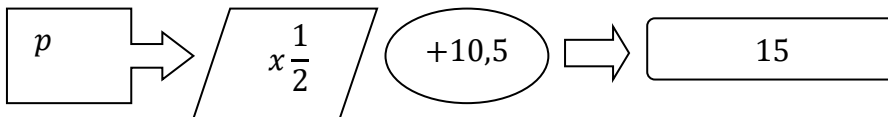
(2)

6. The South African flag may be displayed horizontally or vertically as shown below:



The type of transformation shown above is:

- A. Rotation through 90°
 B. Translation
 C. Reflection
 D. Rotation through 180° (1)
7. Study the flow diagram below and determine the value of p .

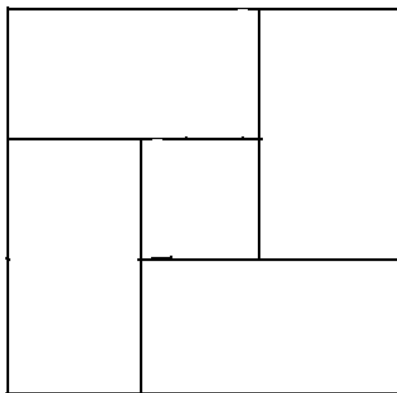


- A. $p = 6$
 B. $p = 4,5$
 C. $p = 9$
 D. $p = 13$ (1)

8. Solve for m if $2^m - 1 = 15$

- A. $m = 5$
 B. $m = 4$
 C. $m = 3$
 D. $m = 1$ (1)

9. The square below is made up of four equal rectangles and a smaller square.



If the length and width of each rectangle is 6 units and 2 units respectively, then the area of the inner square is:

- A. 16
B. 64
C. 48
D. 320
- (2)

10. Write 0,00008 in scientific notation.

- A. $8,0 \times 10^{-5}$
B. $8,0 \times 10^{-4}$
C. $8,0 \times 10^5$
D. $8,0 \times 10^4$
- (1)

11. Which of the following statements is NOT a condition for congruency in triangles?

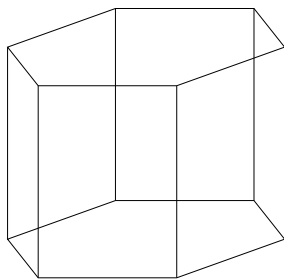
- A. side; side; side
B. side; angle; side
C. 90° ; hypotenuse; side
D. angle; angle; angle
- (1)

12. Refer to the table below which shows the ages of various learners in Grade 9A at Progress High School. What is the mode and range of the ages respectively?

Learner Name	Gert	Rajesh	Jane	Nomusa	Julius	Karabo	Siyasanga
Age	14	16	18	16	18	16	14

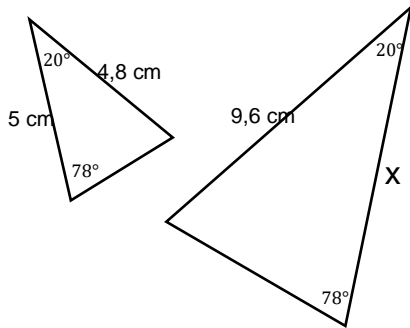
- A. Mode = 16 and Range = 4
B. Mode = 16 and Range = 14
C. Mode = 4 and Range = 16
D. Mode = 16 and Range = 18
- (2)

13. Name the 3-dimensional container below.



- A. Pentagonal prism
B. Hexagonal pyramid
C. Hexagonal prism
D. Cuboid
- (1)

14. What is the value of side x ? The two triangles below are SIMILAR TRIANGLES.

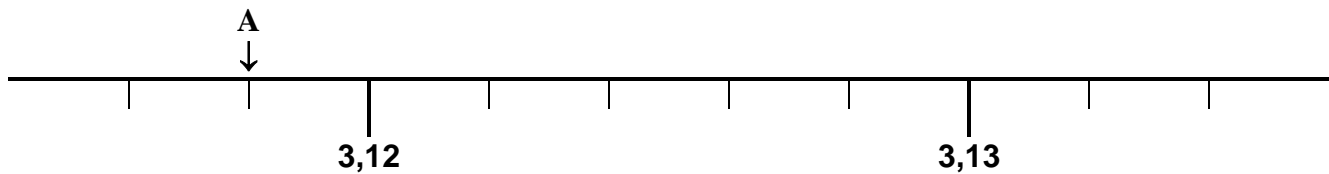


- A. $x = 5\text{ cm}$
 B. $x = 12\text{ cm}$
 C. $x = 14.4\text{ cm}$
 D. $x = 10\text{ cm}$ (2)

15. $\sqrt{5}$ is ...

- A. real and rational.
 B. real and irrational.
 C. non-real.
 D. a positive integer. (1)

16. What number is represented by A on the ruler?



- A. $3,11$
 B. $3,1$
 C. $3,118$
 D. $3,18$ (1)

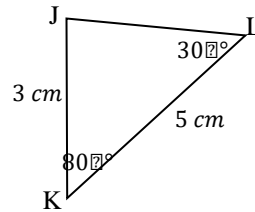
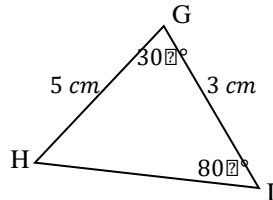
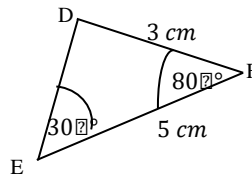
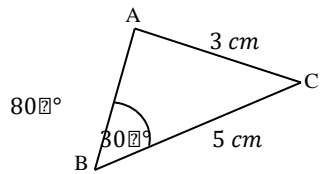
17. A pentagonal pyramid has ...

- A. 4 faces.
 B. 5 faces.
 C. 6 faces.
 D. 7 faces. (1)

18. The next term in the sequence: $2; 8; 18; 32; \dots$ is:

- A. 42
 B. 64
 C. 72
 D. 50 (2)

19. Which of the following triangles are congruent? (The triangles are not drawn to scale)



- $\triangle ABC$ and $\triangle DEF$
- $\triangle ABC$ and $\triangle GHI$
- $\triangle DEF$ and $\triangle GHI$
- $\triangle DEF$ and $\triangle JKL$

(2)
[26]

TOTAL SECTION A: 26

SECTION B

QUESTION 1

1.1 Simplify the following expressions:

2.1.1 $\frac{24k^5m^2}{8k^2m^6}$ (2)

2.1.2 $-[(a - 2)^2 + (a - 3)(a - 2)] + 8$ (4)

1.2 Factorise the following expression completely:

$4(a + b) - x^2(a + b)$ (3)

1.3 Evaluate $111^2 - 99^2$ (2)

1.4 Solve for x:

1.4.1 $3(x + 5) - 6 = -2(x + 1)$ (3)

1.4.2 $3^{x+1} = 27$ (3)

[17]

QUESTION 2

2.1 Study the pattern below and find the following:

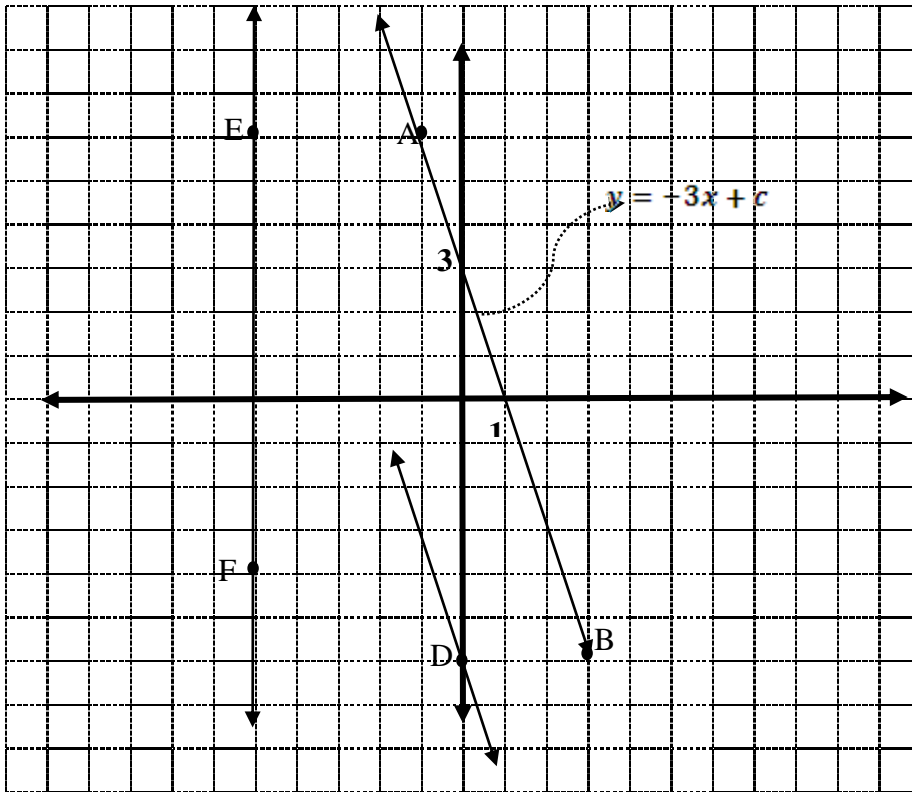
Number	1	2	3	4	5	200	n
Pattern	4	11	18	25			

2.1.1 the 5th pattern (1)

2.1.2 the general rule for this pattern (3)

2.1.3 the 200th pattern (1)

2.2 Study the graphs below and answer the questions that follow:



2.2.1 The line graph with equation: $y = -3x + c$ passes through the points A and B in the sketch above. What is the value of c ?

(1)

2.2.2 If the line passing through D is parallel to line AB, determine its equation.

(2)

2.2.3 Determine the co-ordinates of the x -intercept of the line passing through D.

(3)

2.2.4 What is the equation of line EF?

(2)

QUESTION 3

3.1 Study the following table and answer the questions that follow:

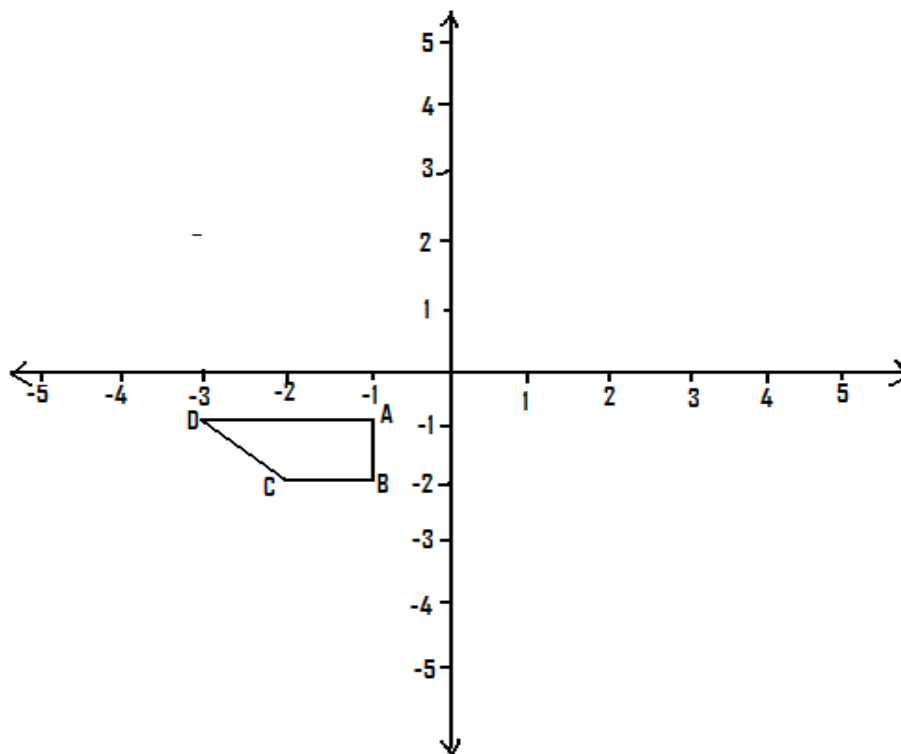
Name of Two-dimensional shape	Number of sides	Number of triangles	Sum of the interior angles
Triangle	3	1	$1 \times 180^\circ$
Quadrilateral	4	2	$2 \times 180^\circ$
Pentagon	5	3	$3 \times 180^\circ$
Hexagon	6		
Any polygon	n		

3.1.1 Use the pattern in the table above to find a value for the sum of the interior angles of a hexagon (1)

3.1.2 Find a general formula for the sum of the interior angles of any n-sided polygon (3)

3.1.3 Name the polygon which has the sum of the interior angles equal to 1080° . (2)

3.2 Study the figure below and answer the questions that follow using the grid provided:



3.2.1 Translate the shape ABCD according to the formula: $(x; y) \mapsto (x + 4; y + 2)$ and draw its image on the grid paper provided. (2)

3.2.2 Now reflect the image about the x-axis and write down the coordinates of the vertices of the reflected image. (3)

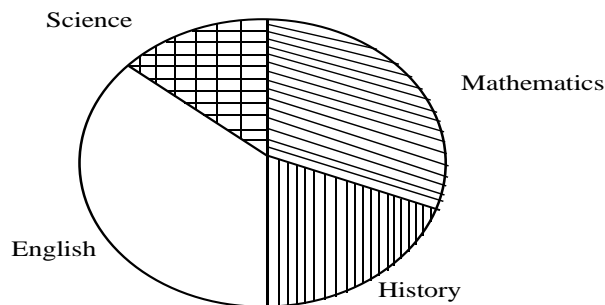
QUESTION 4

- 4.1 A train 1 km long is travelling at a constant speed of 20 km/hour. It enters the tunnel which is 1 km long at 1:00 p.m. At what time does the rear of the train emerge from the tunnel? (4)
- 4.2 A reservoir is $\frac{5}{8}$ full. If 135 litres of water is added, the reservoir is $\frac{8}{11}$ full. What is the capacity (in litres) of the reservoir when full? (4)
- 4.3 A cylindrical tin can with baby powder milk has a radius of 8 cm and a height of 20 cm. Calculate the volume of powder milk in the can if there is a gap of 3 cm to the lid, as shown in the picture. Assume $\pi = \frac{22}{7}$. (Give the answer correct to 2 decimal places).

(4)
[12]

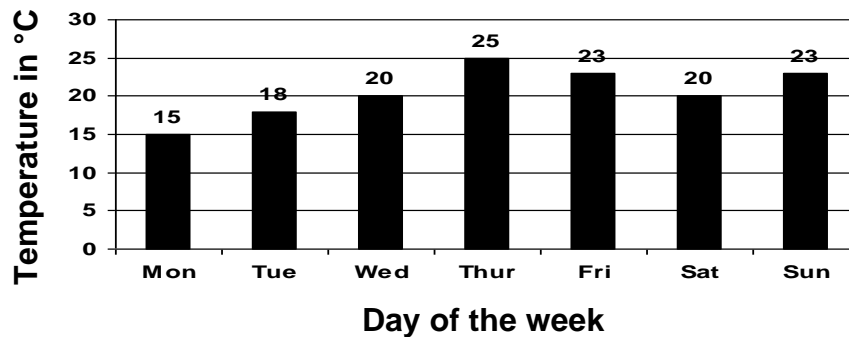
QUESTION 5

- 5.1 Study the pie-chart below which shows the most popular subjects of 120 Grade 9 learners at Tafula High School. If 72° in the chart represents students who prefer History and 126° those who love English, then answer the questions that follow:



- 5.1.1 What fraction of the pie chart represents History students? (1)
- 5.1.2 How many students prefer English? (2)
- 5.1.3 What percentage of the learners prefer Mathematics? (3)

5.3 The temperature, in °C, for each day of the week is represented in the bar graph below:



Using the temperatures given in the graph above determine the following (correct to 2 decimal places):

5.2.1 median (2)

5.2.2 range (1)

5.2.3 mean (3)

5.2 Draw a stem-and-leaf diagram to represent the data. (2)

5.3 Fourteen learners at Mzantsi High School obtained the following results in Mathematics and Language:

Mathematics	10	40	60	70	58	24	75	44	33	28	66	71	14	33
Language	30	50	55	81	48	36	62	29	54	14	55	62	22	46

5.3.1 Draw a scatter diagram to illustrate the results. (Use the grid supplied) (5)

5.3.2 What is the correlation between the marks obtained in Mathematics and Language? Explain your answer. (2)

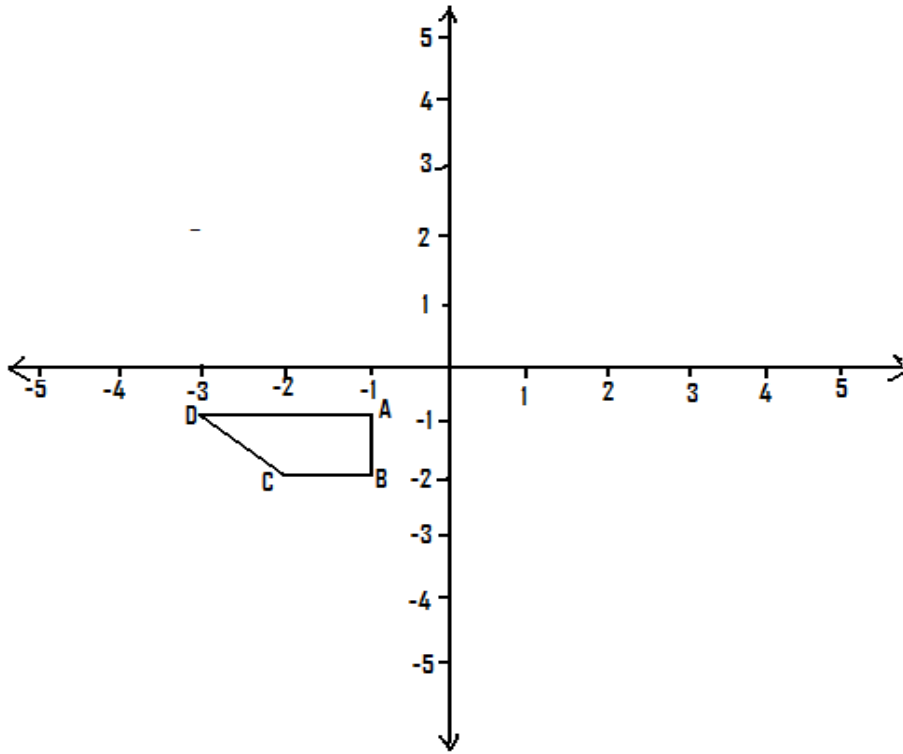
[21]

TOTAL SECTION B: 74

GRAND TOTAL: 100

DIAGRAM SHEET

QUESTION 3



QUESTION 5

