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SENIOR PHASE

GRADE 9

NOVEMBER 2016

MATHEMATICS

MARKS: 100

TIME: 2 hours



This question paper consists of 13 pages including an information sheet.

INSTRUCTIONS AND INFORMATION

1. Read the following instructions carefully.
2. Answer ALL the questions.
3. Write neatly and legibly.
4. Number your answers exactly as questions are numbered.
5. Give reasons for each statement in QUESTION 5 and QUESTION 6.
6. Show ALL working.
7. You may use an approved scientific calculator (non-programmable and non-graphical).
8. Diagrams are NOT necessarily drawn to scale.
9. Use attached ANNEXTURE A to answer QUESTION 3.3.

QUESTION 1

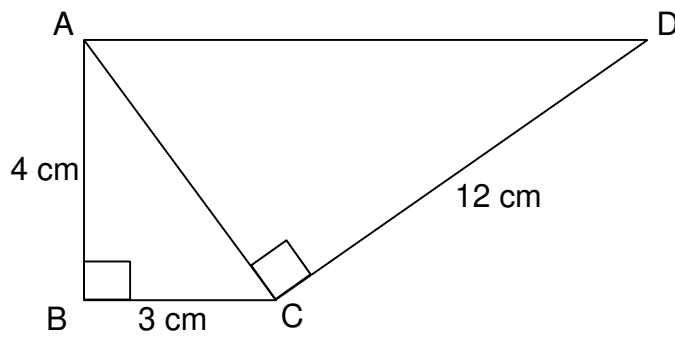
In this question, write only the correct letter next to the corresponding number, e.g. If the correct answer for question 1.1 is D, write **1.1 D** only.

- 1.1 What is the correct pair of values of x in $(x - 3)(x + 2) = 0$?
- A $x = -3$ and $x = -2$
- B $x = 3$ and $x = -2$
- C $x = -3$ and $x = 2$
- D $x = 3$ and $x = 2$ (1)
- 1.2 What is the HCF of 210 and 350?
- A $2 \times 5 \times 5 \times 7$
- B $2 \times 3 \times 5 \times 7$
- C $2 \times 5 \times 7$
- D 5×7 (1)
- 1.3 Calculate: $6 + 6 \div 2 - 6 \times (-2)$
- A 21
- B 18
- C 12
- D 0 (1)
- 1.4 Determine the next term in the pattern 2; 5; 9; 14; ...?
- A 21
- B 20
- C 19
- D 18 (1)
- 1.5 Which of the following statements is true about a kite?
- A The longer diagonal bisects the shorter diagonal at 90° .
- B The shorter diagonal bisects the longer diagonal at 90° .
- C Diagonals bisect each other.
- D Diagonals are equal. (1)



- 1.6 What will be the volume of a rectangular prism if all its dimensions are doubled?
- A $2 \times$ the volume of the original prism.
 - B $4 \times$ the volume of the original prism.
 - C $6 \times$ the volume of the original prism.
 - D $8 \times$ the volume of the original prism. (1)
- 1.7 Which of the following statements has the same effect as rotating an object about the line $y = x$?
- A Rotating the object 270° anti-clockwise.
 - B Rotating the object 90° anti-clockwise.
 - C Rotating the object 180° clockwise.
 - D Rotating the object 90° clockwise. (1)
- 1.8 What will be the total surface area of a cube with a volume of 64 cm^3 ?
- A 96 cm^2
 - B 64 cm^2
 - C 16 cm^2
 - D 4 cm^2 (1)

1.9 What is the length of AD in the figure below?



A 16 cm

B 15 cm

C 13 cm

D 5 cm

(1)

1.10 What is the mode of the scores presented in the frequency distribution table below?

Score	Frequency
111	2
112,1	7
114,3	6
115	2
211	1

A 118,5

B 113,6

C 112,1

D 100

(1)
[10]

QUESTION 2

2.1 Write 0,000 000 674 in scientific notation. (1)

2.2 Simplify:

2.1.1 $\sqrt[3]{x^3} + x^0$ (2)

2.1.2 $\sqrt{0,03 x^8 + 0,01 x^8}$ (2)

2.2.2 $\frac{(2d^2e)^2}{(4d^{-3}e^{-2})^{-1}}$ (3)

2.2.4 $2(x+2)^2 - 2(x+1)(x+2)$ (4)

2.3 Factorise completely:

2.3.1 $x^2 + 5x - 24$ (2)

2.3.2 $2(a-b) - b + a$ (3)

2.4 Solve for x :

2.4.1 $4x - 10 = 6$ (2)

2.4.2 $\frac{3x-10}{2} = \frac{2x-5}{3}$ (3)

2.4.3 $x^2 = 4$ (2)

2.4.4 $3x^5 = 96$ (2)

[26]

QUESTION 3

3.1 Study the geometric pattern below and answer the questions that follow.

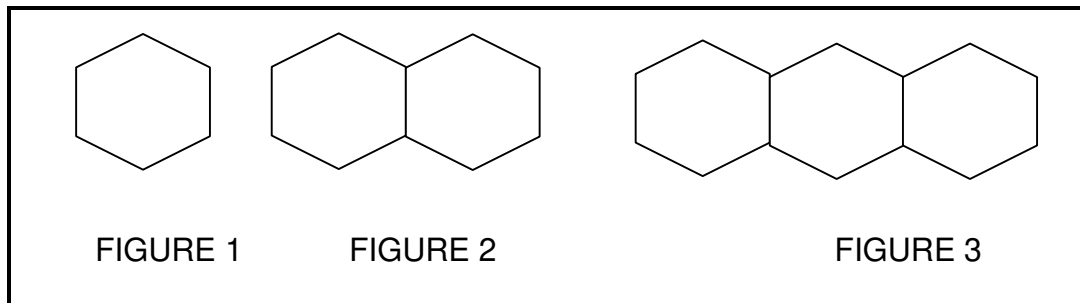
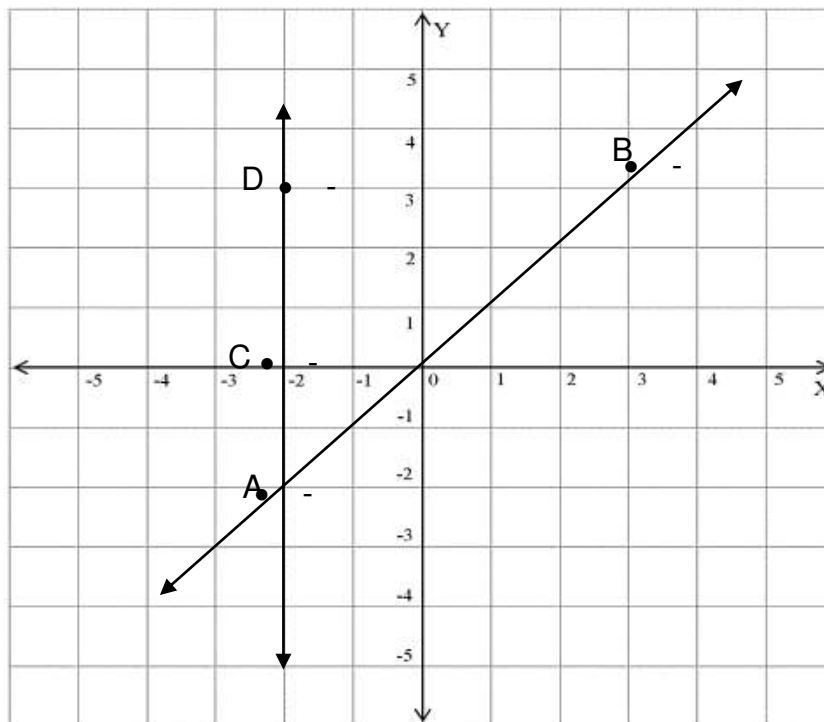


Figure	1	2	3
Number of lines	6	11	

3.1.1 Complete the table. (1)

3.1.2 Write down the general rule for the pattern in the form $T_n =$. (2)

3.2 Study the straight line graphs below and answer the questions that follow.



3.2.1 Write down the equation of AB. (1)

3.2.2 Write down the equation of AD. (1)

3.3 On the attached grid, draw a graph defined by $y = -2x + 1$. Remove the ANNEXURE and attach it in your ANSWER BOOK. (3)

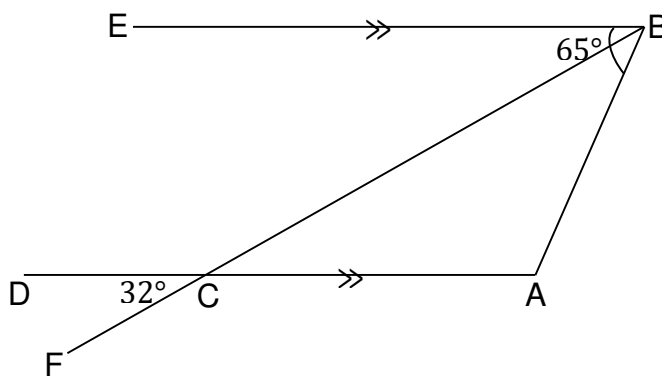
[8]

QUESTION 4

- 4.1 How long will it take an investment of R5 000 at 12% per annum simple interest to earn R1 800 interest? (3)
- 4.2 The sum of two numbers is 143 and their difference is 7, what are the numbers? (3)
- 4.3 There are 10 boxes, five contain pencils, four contain pens and two contain pens and pencils. How many boxes contain no pens and pencils? (2)
- 4.4 A car travelling at an average speed of 100 km/h covers a certain distance in 3 hours. At what average speed must the car travel to cover the same distance in 2 hours? (4)

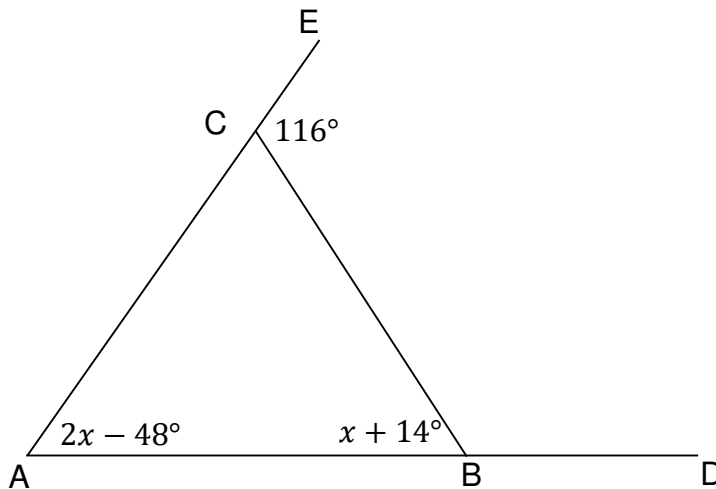
[12]**QUESTION 5**

- 5.1 In the diagram below $\widehat{ABE} = 65^\circ$ and $\widehat{DCF} = 32^\circ$.



- 5.1.1 Calculate the size of $\widehat{EBC}$. Give reasons for your answer. (2)
- 5.1.2 Calculate the size of $\widehat{AB}$. Give reasons for your answer. (3)

5.2 In the diagram below, $\widehat{CAB} = 2x - 48^\circ$, $\widehat{ABC} = x + 14^\circ$ and $\widehat{BCE} = 116^\circ$.

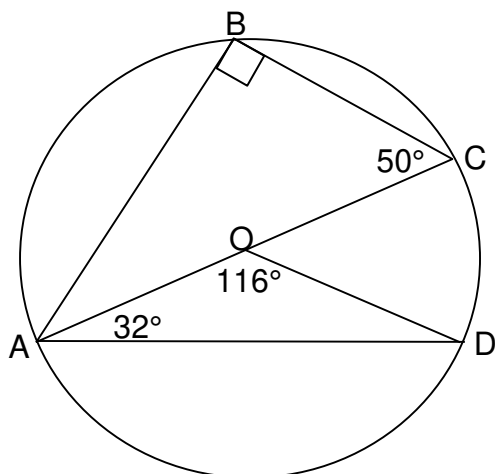


5.2.1 Calculate the value of x . Give reasons for your answer. (3)

5.2.2 Calculate the actual size of $\widehat{CAB}$. (2)

5.2.3 What type of Δ is ΔABC ? Give reasons for your answer. (2)

5.3 In the figure below, O is the centre of the circle.



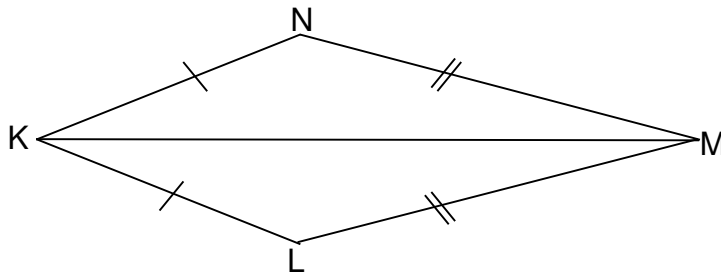
5.3.1 Calculate the size of $\widehat{CAB}$. Give a reason for your answer. (2)

5.3.2 Calculate the size of $\widehat{ADO}$. Give a reason for your answer. (2)

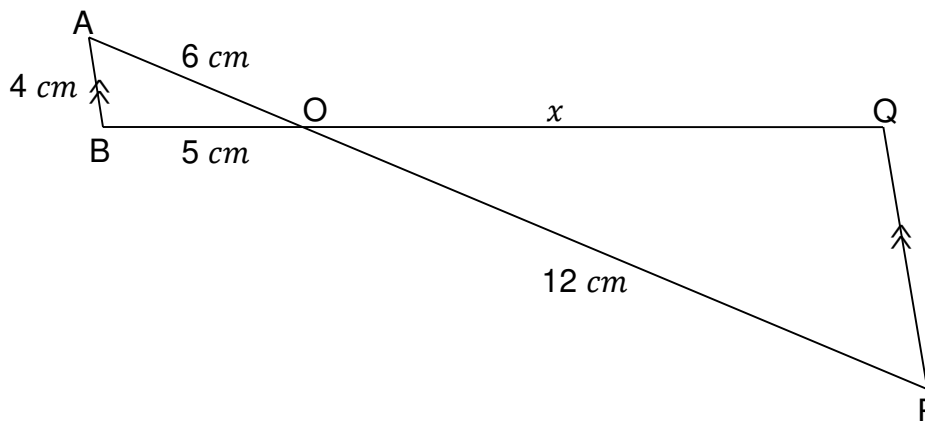
[16]

QUESTION 6

6.1 In the diagram below, prove that $\triangle KLM \equiv \triangle KNM$. (4)



6.2 In the diagram below, $AB \parallel PQ$.



6.2.1 Prove that $\triangle ABO \sim \triangle PQO$. (4)

6.2.2 Calculate the value of x . (3)

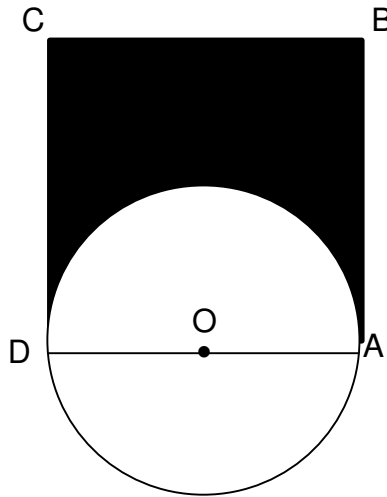
[11]

QUESTION 7

7.1 In the figure below ABCD is a square and AOD is the diameter of the circle.

Calculate the area of the shaded part if $r = 7 \text{ cm}$. N.B $\pi = \frac{22}{7}$

(4)



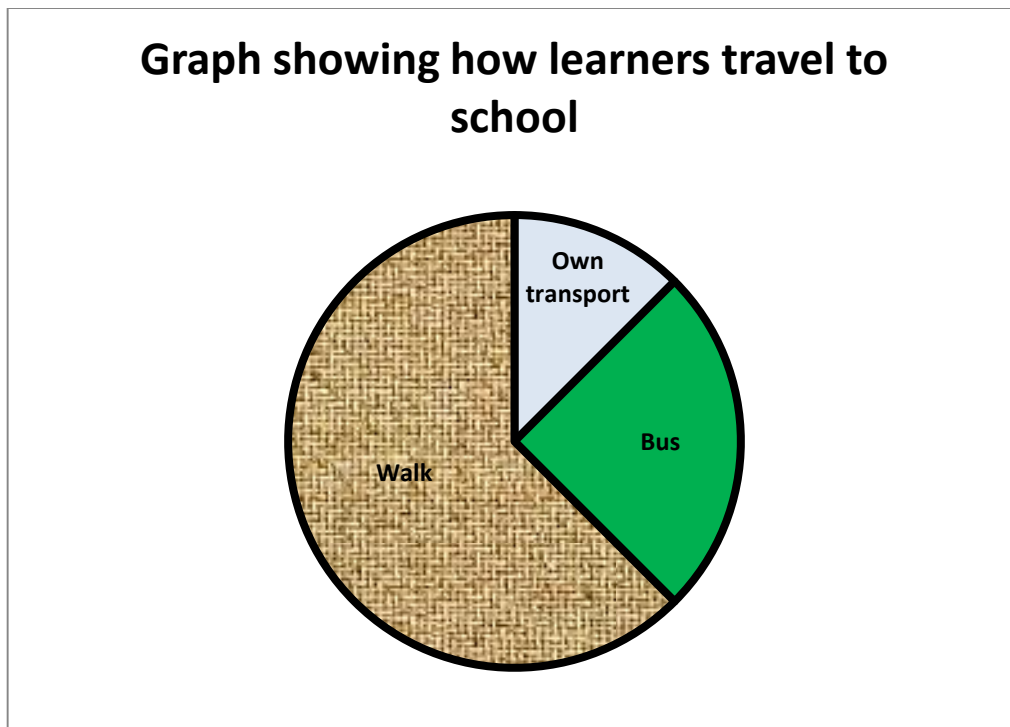
7.2 A rectangular carpet has a perimeter of 16 m and an area of 15 m^2 . What are the dimensions of the sides of the carpet?

(4)

[8]

QUESTION 8

- 8.1 A spinner with 5 colours, red, yellow, green, black and white is spun and a coin is tossed, at the same time.
- 8.1.1 Draw a tree diagram to illustrate the number of possible outcomes for the experiment. (2)
- 8.1.2 What is the probability of spinning any colour and tossing a head? (1)
- 8.1.3 What is the probability of spinning a red colour? (1)
- 8.2 The pie chart below shows different modes of transport used by learners of Boiteko Junior Secondary School when travelling to school. The total number of learners in the school is 600. Study the graph and answer the questions that follow.



- 8.2.1 What fraction of learners walk to school? Give your answer as a fraction. (1)
- 8.2.2 Express the number of learners who travel by bus as a percentage. (2)
- 8.2.3 What is the ratio of learners who walk to school to those who use their own transport? (2)
- [9]**

TOTAL: 100

ANNEXURE A**NAME:****SURNAME:**