Answer **four** questions **only**.
All questions **carry** equal marks.

All working must be clearly shown. Marks will **not** be awarded for correct answers without corresponding working.

1. (*a*) A car consumes a gallon of petrol for every 30km drive. The driver of the car sets out on a journey of 420 km with 10 gallons of petrol in the fuel tank.
   (i) How many more gallons of petrol will be needed to complete the journey?
   (ii) Find the cost of the petrol used for the journey of 420 km if a gallon of petrol cost **GH¢5.50.**

   (b) Expand $(2y + x)^2 - 4x(3y - 2)$ and evaluate when $y = 3 \ and \ x = -2$

   (c) Given that the vector $a = \binom{2}{1}$ and $b = \binom{3}{-4}$, find $2a + b$.

2. (*a*) A bus left town **X** at 6:30 a.m. and arrived at town **Y** at 1:00 p.m. If the bus travelled at an average speed of 100 km per hour, calculate the distance from town **X** to town **Y**.

   (b) Solve $\left(\frac{6}{4p-1} \right) = \left(\frac{4}{3(p+4)} \right)$

   (c) $\frac{3}{7}$ of students in a certain class are males. If there are 36 females, how many students are there in the class?

3. (*a*) The pie chart below shows the distribution of new desks to five classes in the University Junior High School. If **48** new desks were given to School **B**,
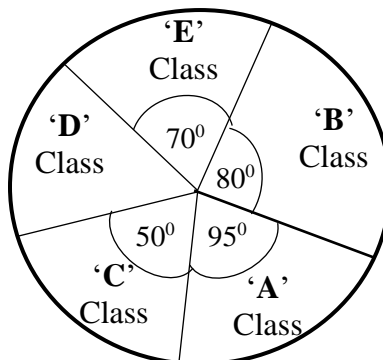

NOT DRAW TO SCALE

   (i) How many desks were given to **each** of the rest of the classes?
   (ii) What is the average whole number of new desks given to the classes?
   (iii) How many classes were able to receive more new desks than the average number?

   (b) Make 'r' the subject of $V = \frac{1}{3}\pi r^2 h$

4.   (*a*)   (i)   Using a ruler and a pair of compasses only, construct triangle PQR such that $\overline{|PQ|} = 10$ cm, Angles QPR $= 45^0$ and PQR $= 60^0$.

(ii)   Construct the perpendicular bisectors of lines PR and RQ to meet at T.

(iii)   Measure the length of TP.

(*b*)   The price of a DSTV decoder at Mr. Brew's shop including Value Added Tax (VAT) is **GH¢ 690.00**. If the VAT rate is 15%, calculate the:

(i)   price of the DSTV decoder excluding VAT;

(ii)   VAT charged.

5.   (*a*)   In the diagram below, P→P', Q→Q', R→R', where P'Q'R' is an enlargement.
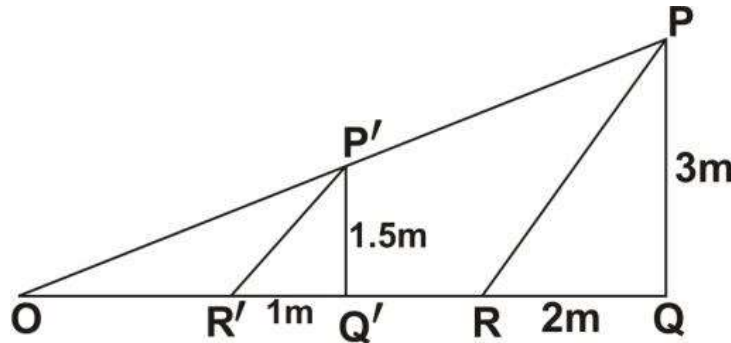
(i)   Calculate the scale factor of this enlargement?

(ii)   If |PR| = 3.6 m, what is |P'R'|?

(*b*)   A rectangular tank of length 20 cm, width 8 cm and height 14 cm is filled with water.
The water is poured into a cylindrical container of radius 7 cm.
Calculate the:

(i)   volume of the rectangular tank.

(ii)   depth of water in the cylindrical container **correct to 3 significant figures**. [Take $\pi = \frac{22}{7}$]

(*c*)   The sum of two numbers is 81. If the second number is twice the first, find the second number.

6.   (*a*)   Solve $\frac{4x-5}{5} + \frac{x+3}{4} \geq -1$, illustrate your answer on a number line.

(*b*)   The three interior angles of pentagon are 100°, 120° *and* 107°. Find the size of each of the remaining two angles, if one of them is two times the other.

(*c*)   Kojo is n years old now.

(i)   How old was he 5 years ago?

(ii)   How old will he be 10 years from now?

(iii)   If his age in 10 years' time will be four times his age 5 years ago, how old is he now?

END OF ESSAY TEST

Each question is followed by four options lettered **A** to **D**. find the correct option for each question and shade in pencil on your answer sheet the space which bears the same letter as the option you have chosen. Give only one answer to each question.

Now answer the following questions.

1. Given that $m = 0.8$ and $n = 0.4$, evaluate $5(n + m)$
    A. 12.0
    B. 6.0
    C. 5.12
    D. 2.5

2. Mr Senyo's son sent him GH¢5,000.00 through a bank which charges 8% commission. How much will Mr. Senyo receive?
    A. GH¢5,250.00
    B. GH¢5,000.00
    C. GH¢4,600.00
    D. GH¢3,250.00

3. Which of the following is a measure of a reflex angle?
    A. 230^0
    B. 110^0
    C. 90^0
    D. 30^0

4. Factorize: $(2a - b)(3r + 2t) - 2r(2a - b)$
    A. $(2a - b)(r - 2t)$
    B. $(2a + b)(r + 2t)$
    C. $(4a - 2b)(5r + 2t)$
    D. $(2a - b)(r + 2t)$

5. The exterior angles of a regular polygon is 18°. Find the number of sides.
    A. 20
    B. 12
    C. 8
    D. 7

6. A container is 10 cm long, 5 cm wide and 3 cm high. How many books can it hold if each book is 5 cm long, 3 cm wide and 2 cm thick.
    A. 30
    B. 10
    C. 8
    D. 5

7. Which of the solid shapes below has 5 faces, 6 vertices and 9 edges?
    A. Triangular pyramid
    B. Triangular prism
    C. Square pyramid
    D. Rectangular prism

Use the diagrams below to answer questions **8** and **9**
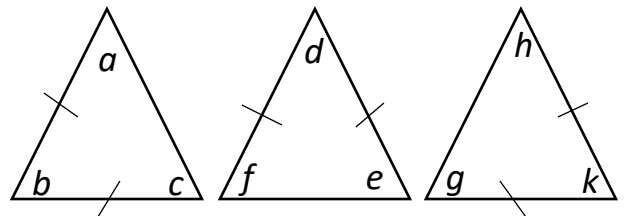
8. Which of the following equations is correct using the **three** triangles above?
    A. $b = a$
    B. $d = e$
    C. $g = k$
    D. $g = h$

9. From the diagrams, *a* and **c** are called
    A. alternate angles
    B. base angles
    C. corresponding angles
    D. vertically opposite angles

10. If $m = 12 - \frac{1}{8} n$, find **m** when $n = 16$.
    A. 2
    B. 8
    C. 10
    D. 14

11. Express 63 as a product of prime factors.
    A. 2^2 x 3
    B. 3^2 x 7
    C. 3 x 5 x 7
    D. 2 x 3 x 7

12. Expand: $(3m + n)(n - 3m)$
    A. $6mn - 9m^2 - 3n^2$
    B. $6mn - 9m^2 + n^2$
    C. $9m^2 - n^2$
    D. $n^2 - 9m^2$

13. Larry left some money to be shared between Claudia and Baawa in the ratio 5 : 7 respectively. If Baawa had GH¢16.00 more than Claudia, find Baawa's share.
    A. 24
    B. 56
    C. 64
    D. 96

14. Make t the subject of the relation
    $$m = \frac{2(b - t)}{c}$$

    A. $t = \dfrac{b}{2} - \dfrac{mc}{2}$

    B. $t = \dfrac{mc}{2} + b$

    C. $t = \dfrac{b - mc}{2}$

    D. $t = b - \dfrac{mc}{2}$

15. Find the median of the following grades:
    6, 7, 5, 8, 7, 4.
    A. 5
    B. 5.5
    C. 6.5
    D. 7

16. Express 0.0000529 in standard form.
    A. 52.9×10^{-4}
    B. 5.29×10^{-5}
    C. 5.29×10^{5}
    D. 529×10^{-6}

17. Calculate the gradient of the straight line that passes through the points L $(-6, -5)$ and M $(0, 1)$.
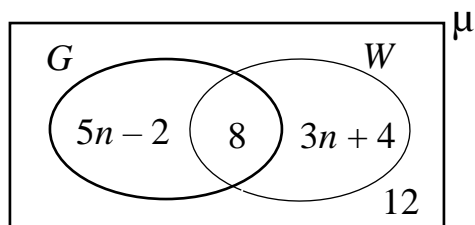   A. 1
    B. -1
    C. $\dfrac{2}{3}$
    D. $\dfrac{3}{2}$

18. Find the value of $3^5 \div (3^7 \div 3^6) \div 3^4$
    A. 0
    B. 1
    C. 3
    D. 9

In the diagram below, **G** and **W** are two intersecting sets in the universal set μ.

*Use it to answer questions **19** to **21**.*

19. Which of the following is the expression for n(**G**)?
    A. $3n + 12$
    B. $5n - 2$
    C. $5n + 6$
    D. $8n - 6$

20. Find the value of n, if n(**W**) = n(**G**)
    A. 2
    B. 3
    C. 4
    D. 5

21. What is the value of μ?
    A. 46
    B. 36
    C. 34
    D. 24

22. Solve: $30 - 3x \geq 4x + 9$
    A. $x \geq -3$
    B. $x \geq +3$
    C. $x \leq +3$
    D. $x \leq -3$

23. Subtract **six hundred** and **forty-seven** from **eight hundred** and **sixty-four**.
    A. one hundred and seventeen
    B. two hundred and seventeen
    C. two hundred thousand and seven
    D. two thousand and seventeen

24. Find the set of integers within the interval $\{53 \leq n \leq 58\}$
   A. {52, 53, 54, 55, 56, 57}
   B. {53, 54, 55, 56, 57, 58}
   C. {53, 54, 55, 56, 57}
   D. {52, 53, 54, 55, 56}

25. What is one-hundredth of 30.27?
   A. 0.3027
   B. 0.03027
   C. 0.003027
   D. 30.27000

26. A ship sails from port **P** to port **K** on a bearing of 240^0. On what bearing will it have to sail to return from **K** to **P**?
   A. 240^0
   B. 160^0
   C. 080^0
   D. 060^0

27. Given the translation vector $\binom{3}{2}$ and image A^1 $\binom{-2}{4}$, find the coordinates of A.
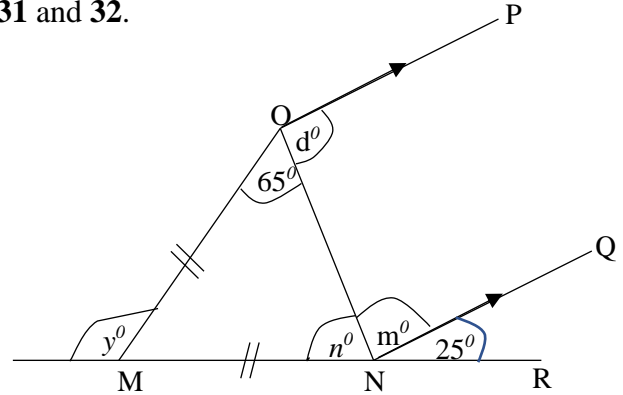   A. A(2, –5)
   B. A(6, 1)
   C. A(–5, 2)
   D. A(1, 6)

28. Find the value of **n** in the diagram below.
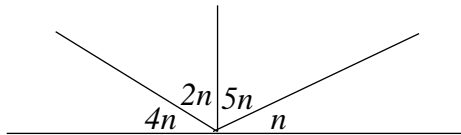
   A. 12^0
   B. 15^0
   C. 22^0
   D. 30^0

29. Last Monday midnight temperature was – 8ºC and by noon it was 6ºC. what was the rise in temperature?
   A. 14ºC
   B. 10ºC
   C. 9ºC
   D. 8ºC

30. A square is 0.49 m^2 in area. What is its perimeter?
   A. 1.8 m
   B. 2.4 m
   C. 2.8 m
   D. 3.8 m

Use the diagram below to answer questions **31** and **32**.

31. What is the value of y^o?
   A. 65º
   B. 120º
   C. 130º
   D. 25º

32. Calculate the value of angle d^o.
   A. 65º
   B. 180º
   C. 25º
   D. 90º

33. Find the least common multiple (LCM) of 18, 16 and 9.
   A. 288
   B. 144
   C. 64
   D. 24

34. If G = {prime numbers less than 23}, find **G**.
   A. {1, 2, 3, 5, 7, 11, 13, 17, 19, 21}
   B. {2, 3, 5, 7, 11, 13, 17, 19, 21}
   C. {2, 3, 5, 7, 11, 13, 17, 19}
   D. {3, 5, 7, 11, 13, 17, 19}

35. Express 1 cm to 1 km as a ratio.
   A. 1 : 100,000
   B. 1 : 10,000
   C. 1 : 1,000
   D. 1 : 100

36. The temperature of a melted metal is 132.974°C. Correct it to **one** decimal place.
   A. 133.0
   B. 133.1
   C. 132.0
   D. 132.1

37. **Fifty-nine** students were at assembly for worship last Wednesday. It was observed that the girls were **seventeen** more than the boys. How many boys were at the worship?
   A. 42
   B. 31
   C. 27
   D. 21

38. The longer hand of a clock is 7 cm when the time was 6:00am. Find the area of the clock. [Take $\pi = \frac{22}{7}$].
   A. 44 cm^2
   B. 77 cm^2
   C. 154 cm^2
   D. 308 cm^2

39. Lois is a phone shopkeeper. She allows a discount of 6% on any Infinix phone. Find the discount on three Infinix phones priced at GH₵560.00 each.
   A. GH₵33.60
   B. GH₵100.80
   C. GH₵336.00
   D. GH₵1,680.00

40. Simplify: $\frac{1}{3}x - \frac{1}{5}(x + 2)$.
   A. $2x - 6$
   B. $\frac{x - 6}{15}$
   C. $\frac{2x - 6}{15}$
   D. $\frac{2x + 2}{5}$

END OF PAPER