

MATHEMATICS PAPER 2

1. Apili has Shs20,000,000 on her fixed deposit account in a bank. The bank gives a compound interest at a rate of 4% per annum. Calculate the amount Apili will receive after 2years.

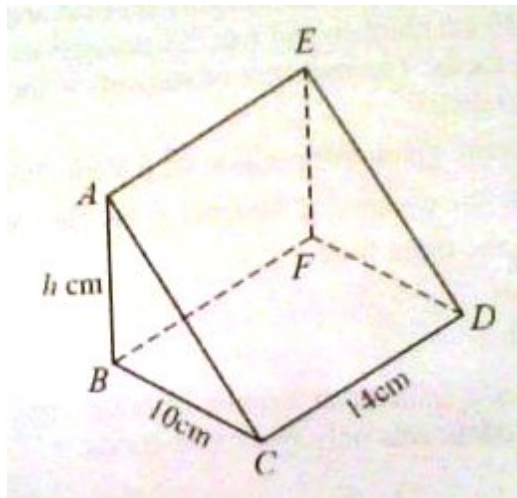
2. Given that $a = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$ and $b=3a$, find $|a+b|$

3. If $7^y = 24$, find the value y , correct to 2 decimal places

4. Two set A and B in the universal set $\#$, are such that $n(A \cap B) = 3$, $n(B) - 5$ and $n(A') = 7$. Use a Venn diagram to find $n(A \cap B)'$

5. An open cylinder has a height of 15cm and a radius of 7cm. Calculate the surface area of the cylinder.

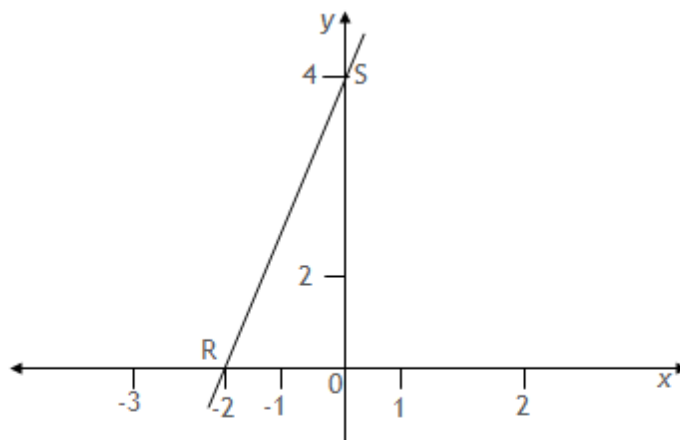
6. The volume of the prism below is 1190cm^3 , $AB = h$ cm, $BC = 10\text{cm}$ and $CD = 14\text{cm}$



Find the value of h

7. Express $0.84545\dots$ as a fraction in its simplest form.
8. The function f is defined as $\# 3^x - 2x$. Determine the range if the domain is $\{0,1,2,3\}$
9. The coordinates of points A and B are $(-5,-3)$ and $(1,9)$ respectively. Find the;
- mid-point of AB
 - length of AB

10. In the diagram below, the line RS cuts the x-axis at R and the y-axis at S



Determine the equation of the line RS

11. a) Show that points A (-3, -2), B(3,1) and C (5,2) lie on a straight line

b) Two points M and N have position vectors $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$ and $\begin{pmatrix} -2 \\ 5 \end{pmatrix}$ respectively.
If P is a point such that $3\vec{MN} = \vec{MP}$, find the coordinates of P.

12. The cost C (Shs) of a roll of cloth is partly constant and partly varies as the square of length l (meters) of the cloth. The cost of a roll of 50m is Shs50,000. The cost of a roll of length 80m is Shs96,800.

a) Form an equation relating the cost, C and the length, l .

b) Calculate the;

i) cost of a roll of length 20m

ii) length of a roll which costs Shs34,700

13. In a class of 68 students, 2 of them do not eat any of the three foods of beef (B), chicken (C) and fish (F). 25 students eat beef and chicken, 19 eat beef and fish while 23 eat chicken and fish. 38 students eat fish. Some students eat all the three foods. The numbers of students in the class who eat only one of the foods are equal.

a) Represent that given information on a Venn diagram

b) Determine the number of students in the class who eat;

i) all the three foods

ii) beef

iii) fish

c) If a student is selected at random from the class, find the probability that the student eats only two of the foods.

14. A car travelling at 12m/s accelerates uniformly and in 3seconds its velocity is 30m/s. It then continues at this velocity for another 4 seconds and finally decelerates uniformly to rest in 6 seconds.

- a) Draw a velocity- time graph for the motion of the car
- b) Using your graph, determine the acceleration of the car.
- c) Calculate the distance travelled by the car in the 13seconds

15.a) The functions $f(y)$ and $g(y)$ are defined as $f(y) = y + 2$ and $g(y) = \frac{y-4}{5}$

Find;

i) $fg(y)$

ii) $fg(9)$

b) If the function $h(x) = \frac{x-4}{x-2}$, determine;

i) $h^{-1}(x)$

ii) $h^{-1}(3)$

16. The table shows the income tax rates of government employees

Taxable monthly income (Shs)	Tax rate
100,000 and less than 200,000	10%
200,000 and less than 300,000	20%
300,000 and less than 400,000	30%
400,000 and less than 500,000	40%
500,000 and over	55%

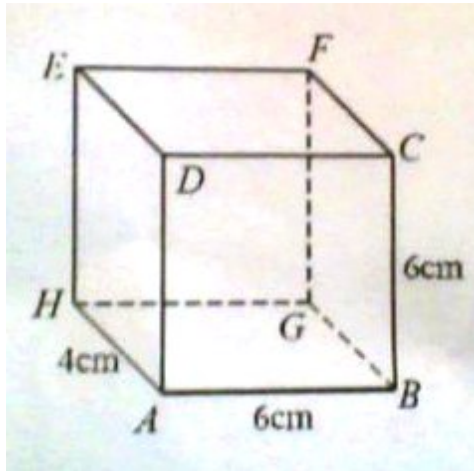
An employee has a gross monthly income of Shs 703,900 including non taxable monthly allowances as given below

- Marriage allowance: Shs 126,500 per month
- Housing and transport: 15% of gross monthly income
- Medical care: Shs 48,00 per month

Find his;

- a) taxable income
- b) net income

17. In the figure below ABCD is a square, $AB = BC = 6\text{cm}$ and $BG = 4\text{cm}$



Calculate the;

- a) i) length of AF
- ii) angle between the line AF and plane ABGH
- b) angle between planes ABFE and ABGH

END

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