

SENIOR 5 SUB-MATHS (S475/1)TERM 1,2020

Students are encouraged to attempt all the given work in order for easy facilitation of the next topics.

1.Simplify the following;

(a) $(3a^3)^2$ (b) $(4y^{-4})^{-3}$ (c) $(3/y^2)^{-2}$ (d) $(6c^{-3})^{-2}/(2c^2)^3$

(e) $(4y^2t)^2/(2y^4t^3)^{-2}$ (f) $\left(\frac{125}{8}\right)^{2/3}$ (g) $\left(\frac{256}{81}\right)^{-3/4}$ (h) $\frac{9^{y+1} \times 6^{y-1}}{3^{2y-1} \times 2^y}$

2) Solve for y if ;

(a) $4^y = 16^{-4y+1}$ (b) $36^{-2y+3} = 216^{2y-3}$ (c) $32^y = 16^{-2y-1}$

(d) $4^y = 0.25$

3)Simplify without table or calculator;

(a) $\sqrt{18} + \sqrt{98}$ (b) $\sqrt{\frac{245}{100}}$ (c) $\sqrt{20} \times \sqrt{45} - \sqrt{80} + \sqrt{20}$

(d) $(3+\sqrt{3})(6-2\sqrt{3})$ (e) $2\sqrt{3}(3\sqrt{3} - 4\sqrt{3})$ (f) $\frac{(\sqrt{6}+\sqrt{3})^2 - (\sqrt{6}-\sqrt{3})^2}{2\sqrt{3}}$

4)Rationalise the denominator and simplify for each case.

(a) $\frac{24}{3+\sqrt{3}}$ (b) $\frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}-\sqrt{3}}$ (c) $\frac{4(3+\sqrt{5})}{(3-\sqrt{3})}$

5(a) Use the matrix method to solve the equations ;

$$3x=16+y, \quad 2y=3-x.$$

(b) If matrices $p = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$, $q = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $r = \begin{pmatrix} 4 & 3 \\ 12 & 5 \end{pmatrix}$ and $pq=r$, find q .

6) The results of the voting in an election were as follows ;

Candidate	Votes
MARY	2045
JANE	4238
JANET	8605
GRACE	12012

Represent this information on a pie diagram.

7(a) Find the mean for the given data;

X	1	2	3	4	5
Frequency ,f	4	5	8	10	17

(b) The table below shows the results of the students of Sub-maths.

Marks	0-9	10-19	20-29	30-39	40-49	50-59
No. of students(f)	7	26	40	46	28	13

(i) Calculate the mean mark. (ii) Draw a cumulative frequency curve and use it to estimate the median mark.

8(a) Convert ; (i) 144km/min into m/s (ii) 360kmhr^{-1} into ms^{-1}

(iii) 45m/s into km/hr

(b) 36km/min into m/s

(c) If the speed of light is $3 \times 10^8 \text{m/s}$ and the distance from the sun to the earth $1.5 \times 10^8 \text{km}$, find the time in seconds taken by the sun to reach the earth.

(d) Janet walks 400m due north in a time of 100 seconds and then 0.7km south in a time of 5 minutes . Find the

(i) average speed (ii) average velocity.