MATHEMATHEMATICS ACTIVITIES FOR S5

1.Simply the following expression

a) $\dfrac{\cos\theta\tan\theta\sin\theta}{\tan\theta}$ **b**) $\sin\dfrac{\pi}{3}\cos\dfrac{\pi}{6}+\cos\dfrac{\pi}{3}\sin\dfrac{\pi}{6}$

c) $\cos\varphi\cos(90-\varphi)-\sin\varphi\sin(90-\varphi)$

2. Angle A is an acute angle and $\sin A=\dfrac{7}{25}$, angle B is obtuse and $\sin B=\dfrac{4}{5}$

Find an exact expression for : **a)** $\sin(A+B)$

b) calculate the value of **x** if $\sin(x+B)=15$

3. construct a circuit of the following statements and explain the observation

a) $p\cup(q\cup r)$

b) $(p\cup q)\cap(p\cup r)$

4. i) show that $p\Rightarrow q$ and $\neg p\cup q$ are logical equivalent and justify your answer

ii) How do we call this tautology ?

5. i) Write down the Cayley table for addition Modulo 5 on the set Z

Or $(Z_5,+)=((\text{mod}5),+)$

ii) Verify if $(z_5,+)$ Cayley table in (bi) above is a commutative group

6. Express the following in symbolic form and then draw it truth table.

" if you go to the market, you will need money and you will be able to buy any thing".

7. construct the truth table of this statement

$[(p\Rightarrow q)\cap(q\cap r)]\Leftrightarrow(p\cup r)$

8. prove that : **a)** $\sin(x+30^o)+\sqrt{3}\cos(x+30^o)=2\cos x$

b) $\text{cose}c\theta-\sin\theta=\cot\theta\cos\theta$

c) hence express $\sin(165^o)$ in surd form

9. Mutesi stand on the bank of river and observes that the angle subtended by a tree on the opposite the bank is 60^o, when she retreats from the bank she finds the angle to be 30^0

Find the height of the tree and the breath of the river

10. In the set $\Re$ is defined the binary law " *" by $a*b=2a+b+1$

a) Evaluate i) $\left[\frac{2}{3}*\left(\frac{-1}{2}\right)\right]*(-1)$ ii) $\left(0*\frac{4}{3}\right)*\left(-2*\frac{1}{3}\right)$

b) is the law * commutative ,associative ?

c) Find The real number x such that : $x*2=\frac{5}{2}*x$

11. two side of triangle have lengths 25cm and 40cm respectively .the measure of their included angle is 30^o, find the length of the opposite 30^o approximately

12. a) convert the following degree :

i) 135^o to radians **iii)** 250 grad to radians

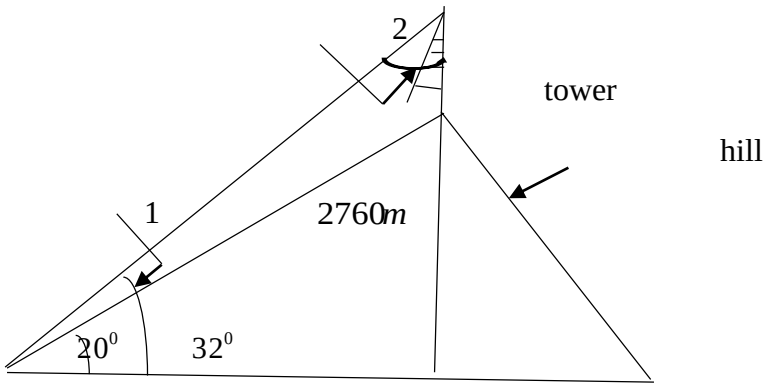
ii) $6\frac{\pi}{6}$ to grades **iv)** $2\frac{\pi}{3}$ to degrees

b) convert from 60.26388889^o to $d^om's''$ system

c) convert from $30^o15'60''$ to decimal degrees

d) define the word " complementary angle"

13. The distance from point A to the top of the hill is $2760m$.the angle of elevation from A to the base of the tower is 28^0 and the angle of elevation from A to the top of the tower is 32^0.



a) find the measures of angles 1 and 2
b) find the height of the tower

14.Solve: a)$cos2x + 7sinx - 4 = 0$

$b)\ 2cos^2x - 11sinxcos + 4 = 0$

15.A ray of light is incident through glass with refractive index 1.5 , on an interface separating glass and water with refractive index 1.32.what is the angle of refraction if the angle of incident of the ray in glass is25^0?

16.Given that 24,5$x + 1$,$x^2 - 1$ are three consecutive terms of an arithmetic progression , find the values of $x$and the numerical value of the fourth term for each value of x found.

17. The product of three consecutive numbers in geometric progression is 27. The sum of the first two and nine times the third is -79. Find the numbers.

18.Insert 6 geometric means between 1 and - $\frac{1}{128}$.

19.Find the general solution of $9^{cosx} - 2.3^{cosx} + 1 = 0$

20.Solve for x : a) $\begin{cases} \ln(xy) = 7 \\ \ln\frac{x}{y} = 1 \end{cases}$

b) $\log_x 5 = \log_5 x$

c) $sin3x\ cos7x = 0$

21.A man deposits 800,000frw his savings account on which interest is 15% per annum.If he makes no withdrawals ,after how many years will his balance exceed 8millions frw?

22.The end points of a straight line are given by $(0.3,0.8)\ and\ (1.8,2.7)$.Extrapolate the value of $x = 2.3$

23.If $A = \begin{pmatrix} -1 & -3 \\ 1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 6 & 3 \\ 2 & 1 \end{pmatrix}$, Find a) A^-, $b)\ B^- and\ c)\ (AB)^-$

24.Consider the following linear transformation defined on R^2 by $f(x,y) = (4x - 2y, 2x + y)$.Determine its matrix relative to the basis $e_1 = (1,1), e_2(-1,0)$

25.The heights (in meters) of six children are 1.42,1.35,1.37,1.50,1.38 and 1.30. Calculate the mean height and the standard deviation of the heights.

GOOD-LUCK!!!!!!!!!!