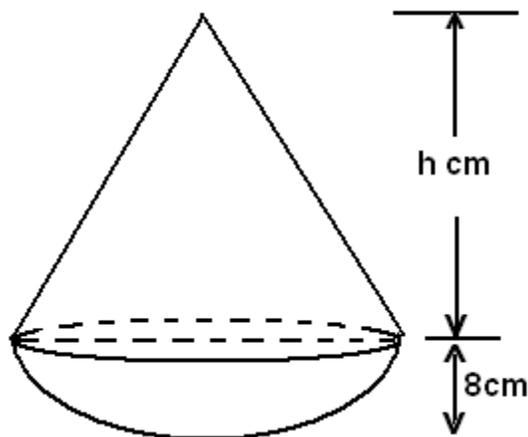


SENIOR FOUR MATHEMATICS EXERCISE TWO.

1. **Evaluate** using logarithms

$$\frac{2845 \times \sqrt{0.00675}}{38.78^2}$$

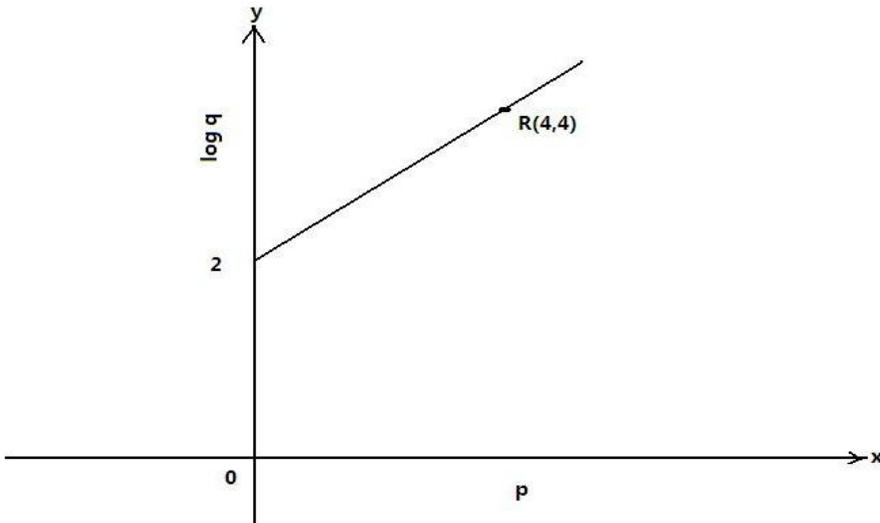
2. Omogo was asked to expand $(x-y)^2$ and she gave her answer as $x^2 - y^2$ **Determine** the percentage error if $x = 9$ and $y = 3$
3. Given that Z varies directly as square of X and inversely as the square root of y . If $X = 2, y = 9$ when $Z = 3$ Find Z when $x = 3$ and $y = 4$
4. Mr Otieno bought a car valued at sh 1,000,000 the value of the car depreciated at 7.5% semi annually. How long would it take its value to depreciate to sh 500 000
5. **Solve** for x in the following equation $2^{2x} - 2^{x+2} + 3 = 0$
6. A two digit number is formed using the prime numbers below 10. Determine the probability that the number formed is an even number
7. The diagram shows a cone on top of a hemisphere. The radius of the hemisphere is 8cm. The height of the cone is h cm
(a) **Find** the volume of the hemisphere



- (b) The volume of the cone is half the volume of the hemisphere. **Find** the value of H .

8. The time in minutes, six people took to complete a task is given below. **Find** the mean of the times 11,15, 21, 23, 25, 31

9. Use the graph below to make q the subject of the formula connecting $\text{Log } q$ and p



10. The vertices of a triangle are $A(-2,1)$ $B(0,5)$ and $C(4,3)$
Show that the triangle is isosceles

11. Under a transformation whose matrix is $T = \begin{bmatrix} a-2 & -2 \\ a & a \end{bmatrix}$ a figure whose area is 2.5 cm^2 is mapped onto a figure whose area is 10 cm^2 . **Find two** possible values of a and hence write down two possible matrices.
(3mks)

12. A , B and C are three points for which $OA = 3\mathbf{i} + 2\mathbf{j} + 6\mathbf{k}$ and $OB = \mathbf{i} - 2\mathbf{j} - 5\mathbf{k}$. ABC is a straight line and $AB: BC = 3:2$ find OC

13. A triangle T , $A(1,1)$, $B(3,1)$, and $C(1,4)$ undergoes the following transformations in the given order
i) Rotation $R+90^\circ$ about $(1,1)$ to image T_1
ii) Reflection F in the line $y = x$ from T_1 to T_2

a) On the graph papers **show** the images T , T_1 and T_2

14. (a) **Complete** the table below for the functions $y = \frac{3}{2} \tan x$ and $y = 2\cos x - 1$ for $0 \leq x \leq 90$

x	0°	10°	20°	30°	40°	50°	60°	70°
$\frac{3}{2} \tan x$								
$2 \cos x - 1$								

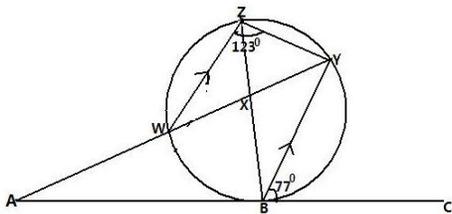
(b) **Draw** the graph of the two functions on the same grid.

(c) Use your graph to solve the equation

(i) $3 \tan x + 2 = 4 \cos x$

(ii) $2 \cos x - 1 \geq 0$

15. In the diagram ABC is a tangent to the circle. BY and WZ are parallel BZ and WY meet at X angle $\angle YBC = 77^\circ$ and angle $\angle WZY = 123^\circ$



(a) **Find** $\angle BWY$ with reasons

(b) **Find** $\angle YBZ$

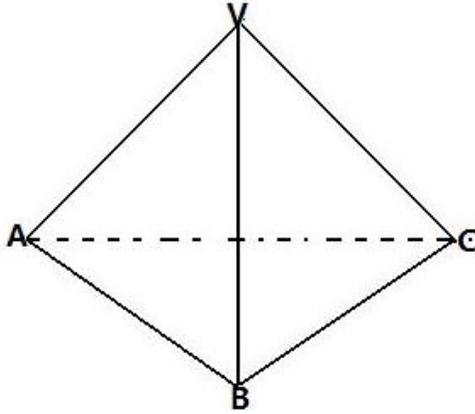
(c) **Show** that $\triangle XWZ$ is isosceles

Let $AY = x$ cm and $AW = Y$ cm

(d) **Find** AB in terms of X and Y

(e) If $BX = 4$ cm $BZ = 7$ cm and $WX = 6$ cm **find** XY

16. The figure below with VAB, VBC, VAC and ABC are equilateral triangles with sides 6cm



- a) **Draw** the net of the fig figure
- b) **Calculate** the height
- c) **Calculate** the angle between line vc and the plane ABC
- d) **Calculate** the angle between plane VAB and plane ABC