## ANSWERS TO ACTIVITY 9 AND 10.

1.The principle of moments states that at equilibrium,the anti clock wise moments are equal to clock wise moments.

2a. pivot
b. Levers
c. First class levers.
d. Note the formula; FORCE(LOAD) X DISTANCE(LOAD ARM)=FORCE(EFFORT) X DISTANCE(EFFORT ARM).

LXL.a
= E X E.a.
$30 \mathrm{~kg} \times 4 \mathrm{~m}$
120
120/6
20

$$
\begin{gathered}
=X \times 6 \mathrm{~m} \\
=6 \mathrm{X} \\
=6 \mathrm{X} / 6 \\
=X
\end{gathered}
$$

Therefore the value of x above is 20 kg of beans.
3.draw referring to the next page 17.
b. To find how far/distance, you need to first identify the load and distances on either sides.

SOLUTION
Force $\times$ Distance on left $=$ Force $\times$ Distance on right ie
Dady x distance $\mathrm{A}=$ Daughter x distance
$60 \mathrm{~kg} \times \mathrm{A}=40 \mathrm{~kg} \times 3 \mathrm{~m}$.
$60 \mathrm{~A}=40 \times 3$
60a $=120$
60A/60 $=120 / 60$
A=2m
Therefore the length/distance of the man to the daughter is $3 \mathrm{~m}+2 \mathrm{~m}=5 \mathrm{~m}$. OR The man is 5 m from the daughter.

4a.try it
b. LX L. $\mathrm{a}=\mathrm{EXE}$.a
$50 \mathrm{~kg} \times \mathrm{ym}=40 \mathrm{~kg} \times 5 \mathrm{~m}$
$50 x y=40 x 5$
$50 y=200$
$50 y / 50=200 / 50$
*Y $\quad=4 \mathrm{~m}$. so Matilda is 4 m far from the fulcrum.
c). $y+5 m$
$4 m+5 m$
$=9 \mathrm{~m}$. so Matilda is 9 m from Rose.
$5 a$. The woman is heavier.
b.w is the Fulcrum/pivot
c. Let the distance be n

LXL.a=EXE.a
$30 \mathrm{~kg} \times(2 \mathrm{~m}+\mathrm{n})=(60 \times 4 \mathrm{~m})$
$30 \times(2+n) \quad=60 \times 4$
$60+30 n=240$
$30 n+60-60=240-60$
$30 n+0=180$
$30 \mathrm{n}=180$
$30 n / 30=180 / 30$
$N=6 m$
Therefore the woman should move 6 m forward to balance with the man.

## ACTIVITY 10.

1.You have been dealing with two loads on a lever.Now,there are 3 loads on a lever. But Using the same formula;L X L.a = E X E.a,LETS call the first load with 5 kg to be Dady, then the $2^{\text {nd }} \operatorname{load}(p)$ to be Mummy carrying you with 2 kg . We now find out Dady's weght ok?. Now I will say for instance;

FINDING THE VALUE OF P
$5 \mathrm{~kg} \times 4 \mathrm{~m}=2 \mathrm{~kg} \times 2 \mathrm{~m}+\mathrm{p} \times(2 \mathrm{~m}+2 \mathrm{~m}$ ie Distance from the fulcrum to the weight p$)$
$20=2 \times 2+\mathrm{p}(2+2)$
$20=4+4 p$
$20-4=4-4+4 p$
$16=4 \mathrm{p}$
16/4 4p/4
$4 \mathrm{~kg}=\mathrm{p}$
Therefore p is $=$ to 4 kg .
No2. FINDING THE VALUE OF W
LXL.a = E XE.a
$90 \mathrm{Kg} \times 9 \mathrm{~m}=\mathrm{Wkg} \times 5 \mathrm{~m}+50 \mathrm{~kg} \times(5 \mathrm{~m}+11 \mathrm{~m})$
$90 \times 9=5 \mathrm{w}+50 \times 16$
$810=5 w+800$
$810-800=800-800+5 \mathrm{w}$
$10=0+5 \mathrm{w}$
$10 / 5=5 w / 5$
$2=\mathrm{w}$
Therefore the value of $\mathrm{W}=2 \mathrm{Kg}$.
No3. FINDING THE VALUE OF X
LOAD X LOAD ARM $=$ EFFORT $X$ EFFORT ARM
$100 \mathrm{gm} \times 35 \mathrm{~m}=50 \mathrm{gm} \times X \mathrm{~m}+150 \mathrm{gm} \times(10 \mathrm{~m}+X \mathrm{~m})$
$100 \times 35=50 x+150 \times(10+x)$
$3500=50 X+1500+50 X$
$3500-1500=50 X+150 X+1500-1500$
$2000=200 X$
$2000 / 200=200 \mathrm{X} / 200$
$10=X$
Therefore the value of $X$ is 10 m .

