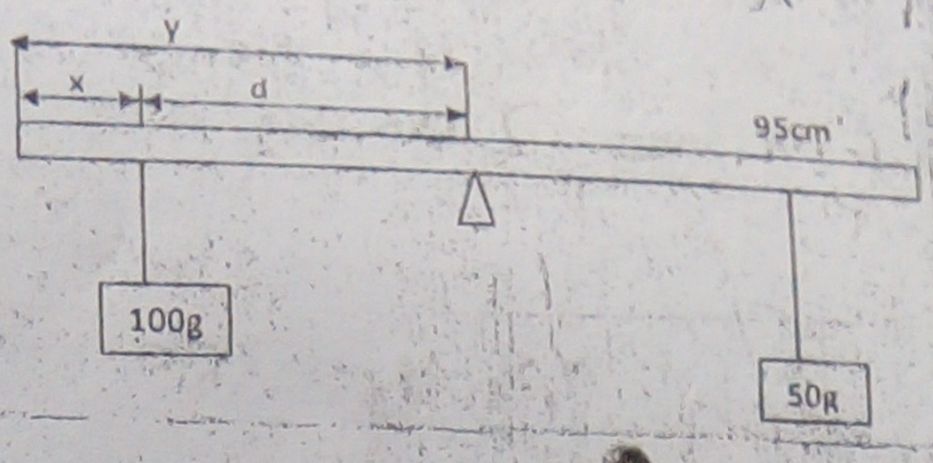
CHUKWUEMEKA ODUMEGWU OJUKWU UNIVERSITY, ULI
DEPARTMENT OF INDUSTRIAL PHYSICS
SEMESTER: FIRST SESSION: 2015/2016
Course Code: Physics 191 Title: Practical Physics 1 Time: 2 Hrs
Instruction: Answer all questions.

Q.1



The diagram above shows a uniform metre rule with a mass of 50g hung at the 95cm mark, 100g mass is then hung by means of a short thread from the 5cm mark and the rule balances on a knife edge as shown in the diagram above. The scale reading x cm of the point of attachment of the 100g mass and y of the position of the knife edge were recorded. The distance d between the point of the 100g mass and the knife edge was calculated.

The experiment is repeated with 100g mass hung at x_1, x_2, x_3, x_4 and x_5 cm positions along the rule and the values of x, y and d in each recorded. The small mass is detached and its mass determined and recorded. i. Read and record the positions in cm of $x_1, x_2, \ldots x_5$ in fig 2a.

ii. Also read and record the corresponding positions of the knife edge, $y_1, y_2, \ldots y_5$ in fig 2b.

iii. Determine the value of d in each case.

iv. Plot a graph with y on the vertical axis and d on the horizontal axis.

v. Determine the slope s of the graph and find the value of $\frac{1}{s}$.

vi. Find the error in the slope.

vii. Define moment of a force and state the principle of moment.

viii. State the conditions for equilibrium for a number of parallel forces.

ix. Define centre of gravity of a body. 50 marks

Q. 2. (a). In rolling a cylinder down an inclined plane, the following results for the time were obtained: 6.20, 6.20, 6.00, 6.30, 6.20, 6.00, 6.40, 6.30, 6.00, 6.50, 6.40 and 6.70 seconds.

Calculate: I. the standard error in the mean.

II. Fractional or relative error.

III. Percentage error 10 marks

(b). The expression $Y = MX^C$ relates values of Y against corresponding values of X obtained by a student in a physics experiment. Linearize the expression so that it can be used to plot the graph of Y against X and briefly explain how the values of M and C can be obtained from the graph. (10mks)

x_1 6.20
x_2 6.20
x_3 6.00
x_4
x_5

All these Questions are Repeated Questions Check for Solution Within.

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(NO1 qi)

Random Erro is erro that causes readings to fluctate or become Inconsistence both It's mostly

(eg) the ... rule is 1mm or 0.1cm ... the reading accurate ... rule is 0.1cm

NO8

NO7

Physic Practical
2015/2016
Engr Plasmo

NO1 Viii

(1) The net force in all direction must be Zero
$\Sigma fx = 0$, $\Sigma fy = 0$
(2) The Net torque acting On the Object must be Zero.

NO1 ix

Center of gravity of an Object is the average location of the weight of an Object

NO1 a

S/N	x cm	y cm	(y-x) d cm
1	2.20	50.00	47.80
2	4.20	54.00	12.00
3	6.40	55.00	48.60
4	8.40	56.00	47.60
5	10.60	59.00	48.40

NO1 a(r)

$$\text{Slope} = \frac{y_2 - y_1}{d_2 - d_1}$$

$$\Rightarrow \frac{64-35}{40-68} \Rightarrow \frac{29}{28}$$

$\therefore$ Slope $= -1.036$

Value for 1/s $= 1/1.036$

$= 0.966$

NO1 vi

Erro in slope or Standard erro in slop

$$\Rightarrow \frac{4w}{NR}$$

w = Vertical Scatter
N = NO of Points plotted
R = Range

$\therefore w = 9cm$, $N = 5$, $R = 36.6cm$

$$\therefore \varepsilon_s = \frac{4 \times 9}{5 \times 36.6} = \frac{36}{183}$$

$= 0.1967$

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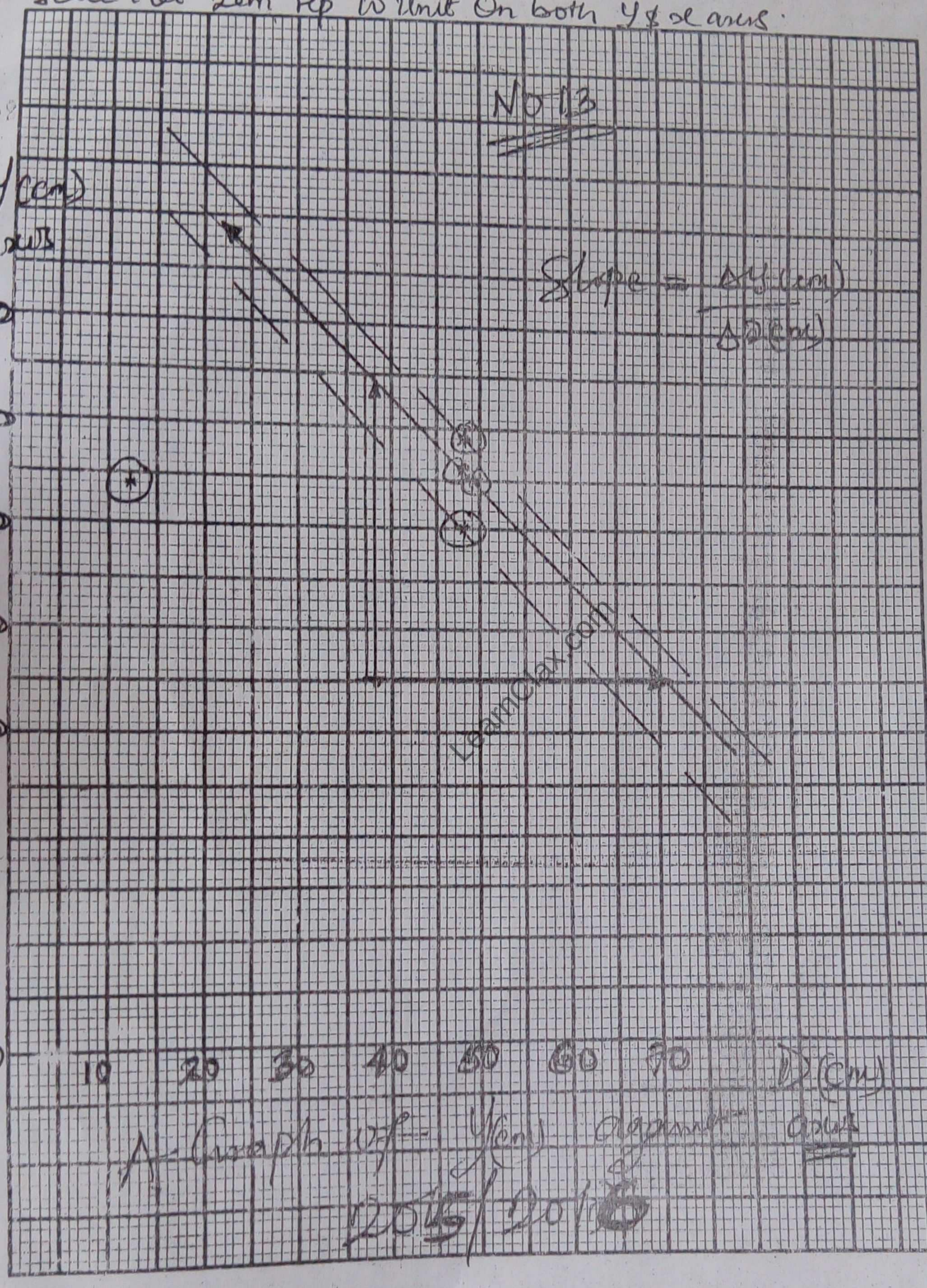
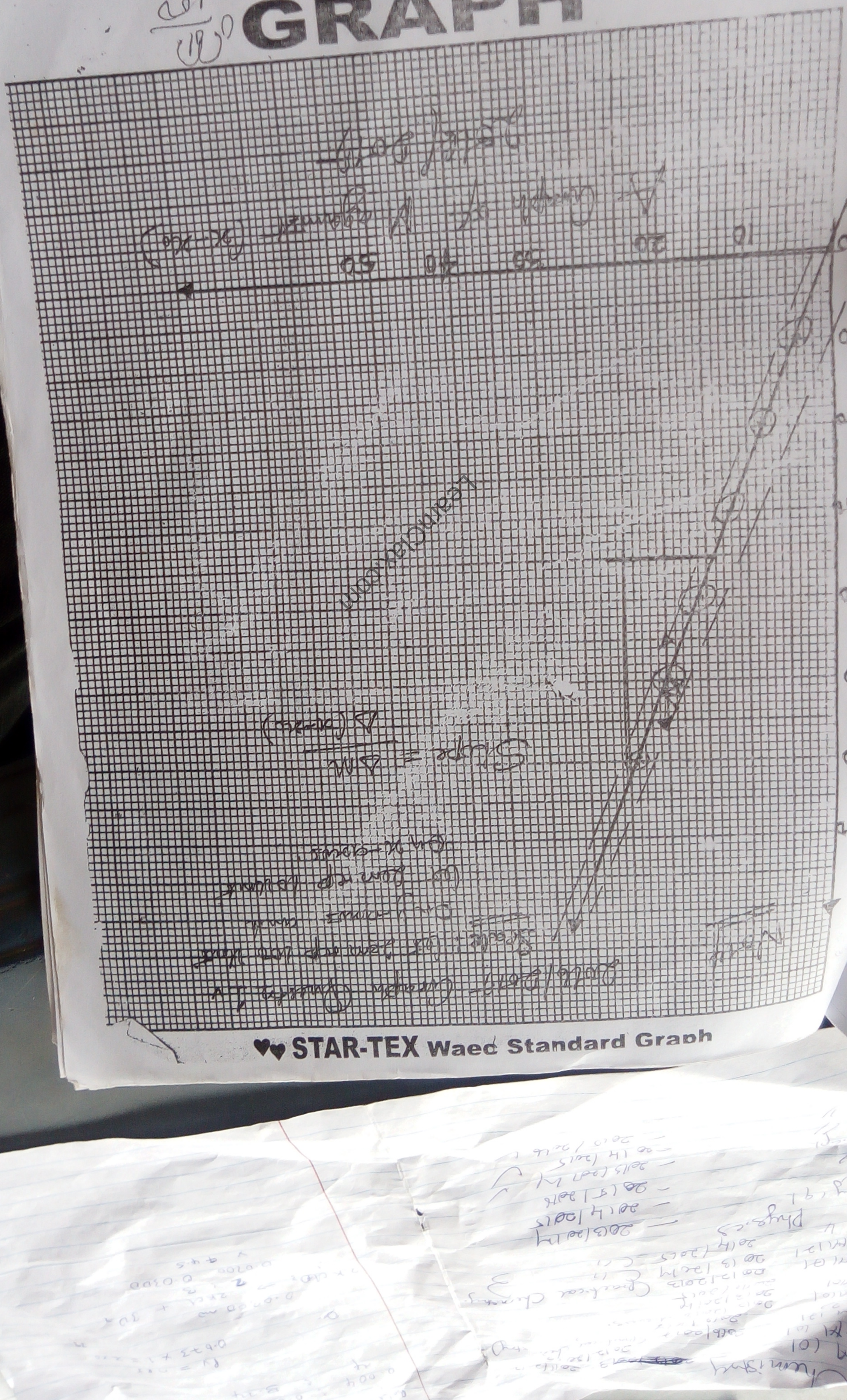
2015/2018 Graph Question 1a

Scale: 1cm rep 10 Unit On both y & x axis.



GRAPH



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