

How to find the slope of curved graph?

Slope of straight line graph is constant which can be determined by taking any two points on the graph line while slope of curved graph changes from point to point. So, we can find slope at any point by drawing tangent at that point and then taking any two points on tangential line (as discussed above for straight line), finding x and y intercept and using the formula

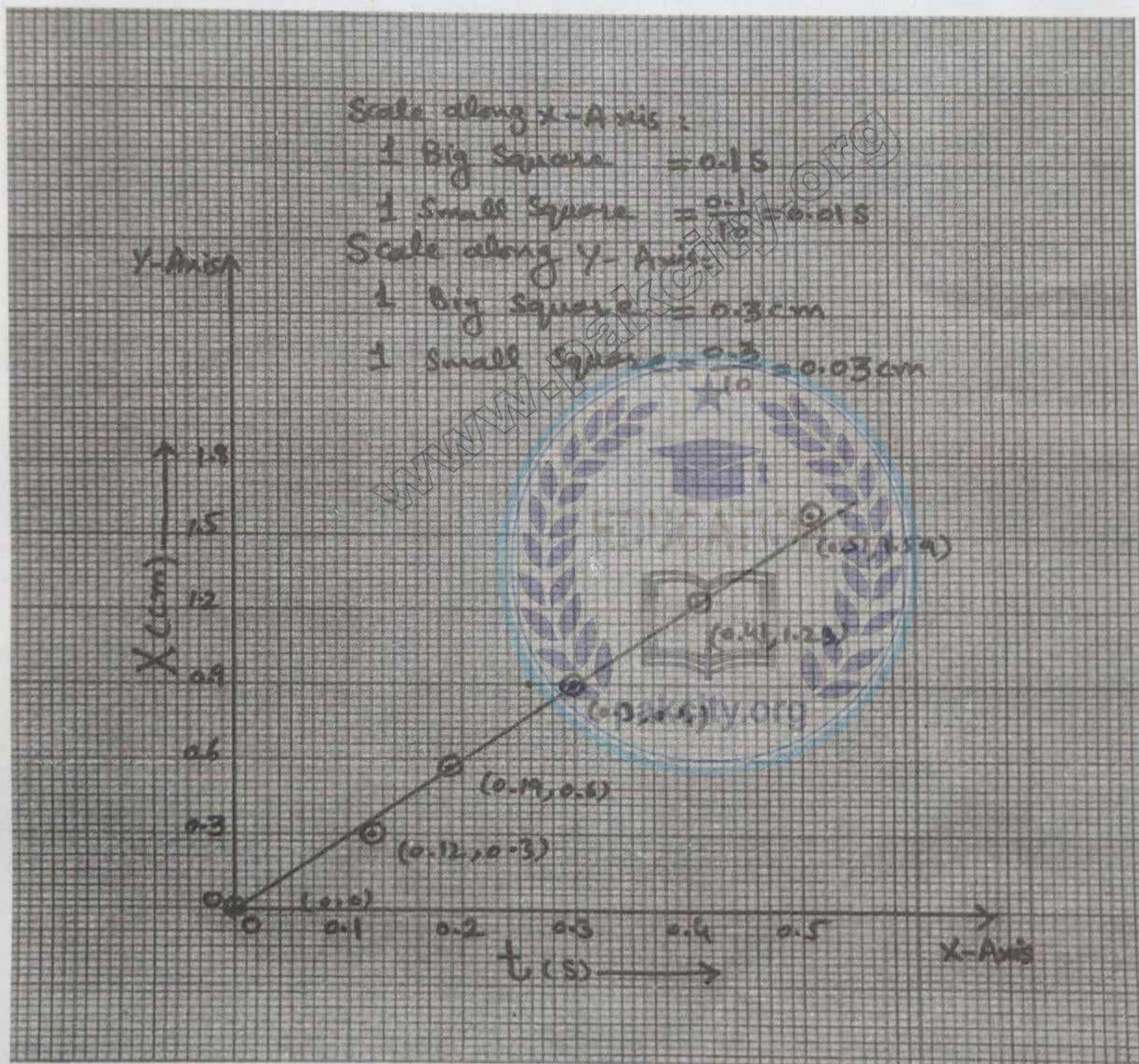
$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$$



Important Experimental Graphs taken out from Board Papers

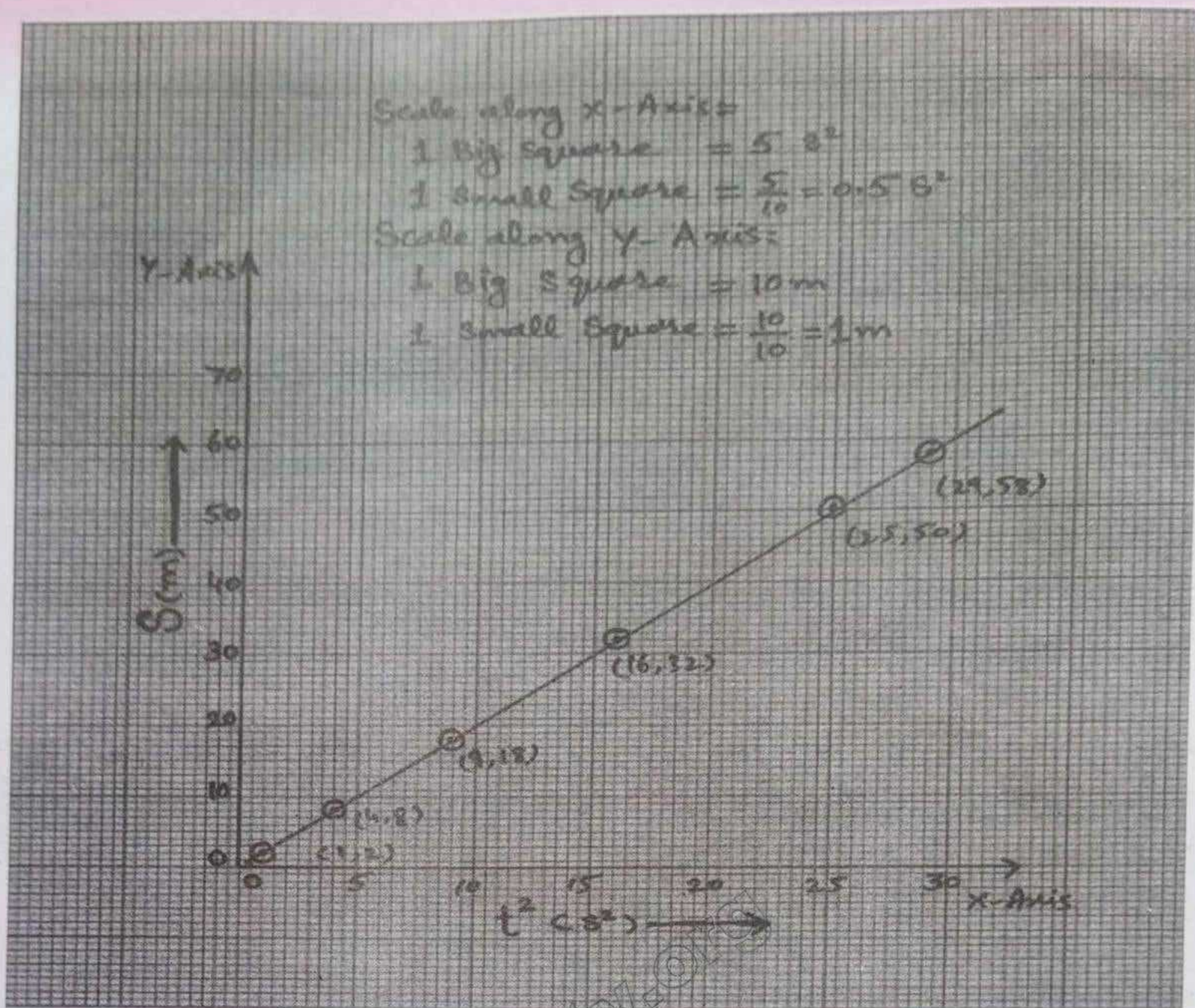
Q.1: Draw a graph between t and x.

t (s)	0	0.12	0.19	0.3	0.41	0.51
X (cm)	0	0.3	0.6	0.9	1.23	1.59



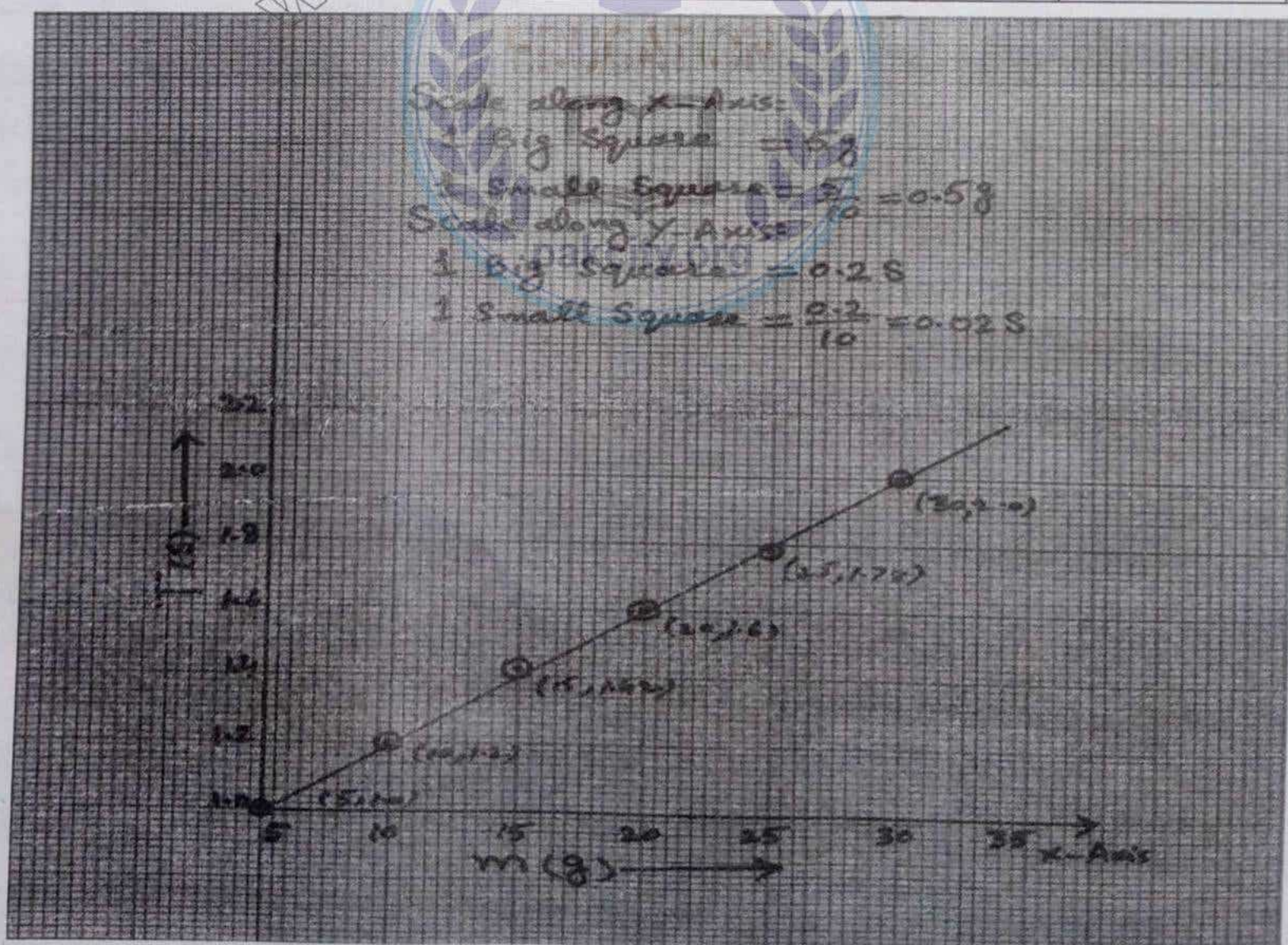
Q.2: Draw a graph between t and S.

t ² (s ²)	1	4	9	16	25	29
S (m)	2	8	18	32	50	58



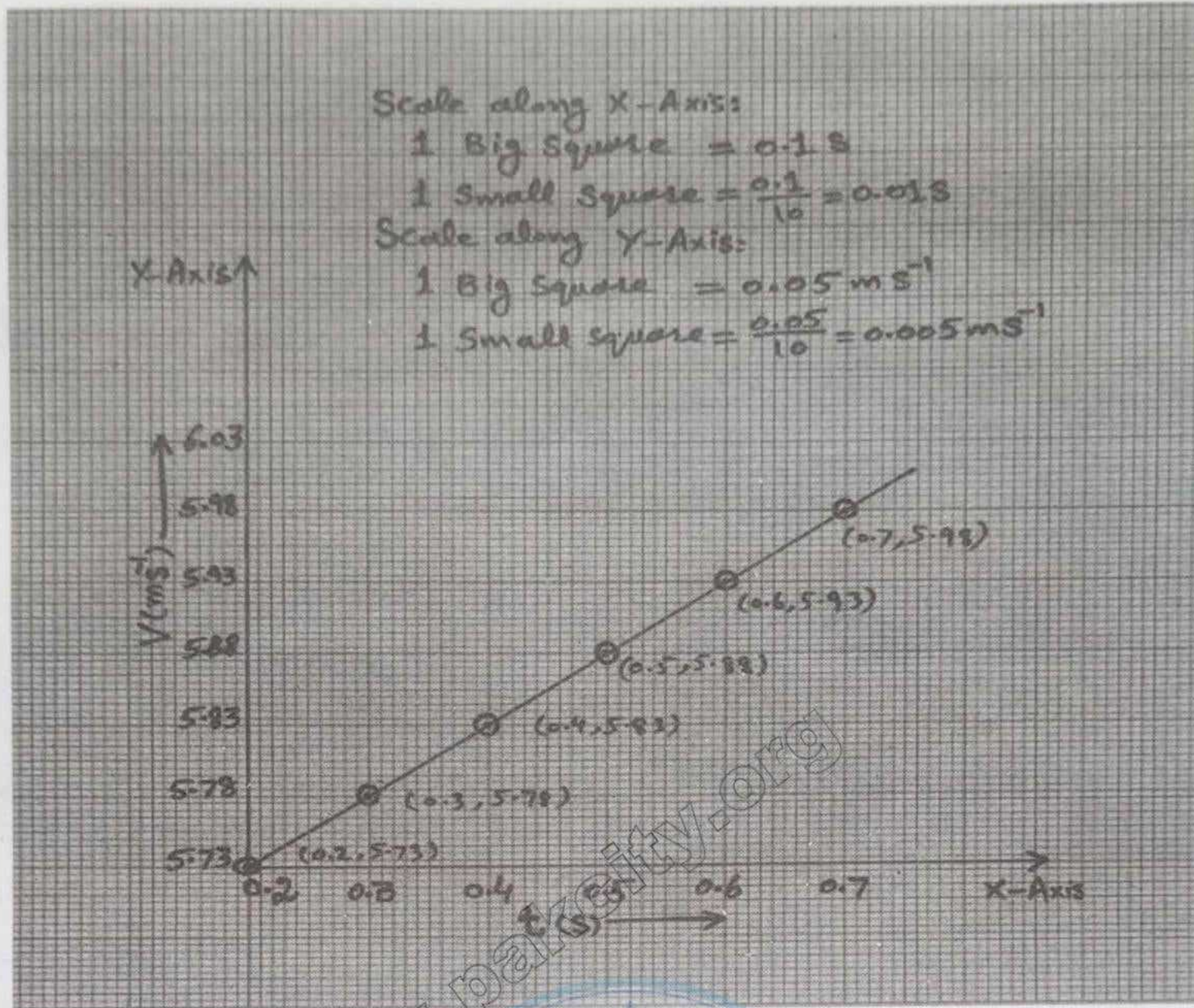
Q.3: Draw a graph between m and T.

m (g)	5	10	15	20	25	30
T (s)	1.0	1.2	1.42	1.6	1.78	2.0



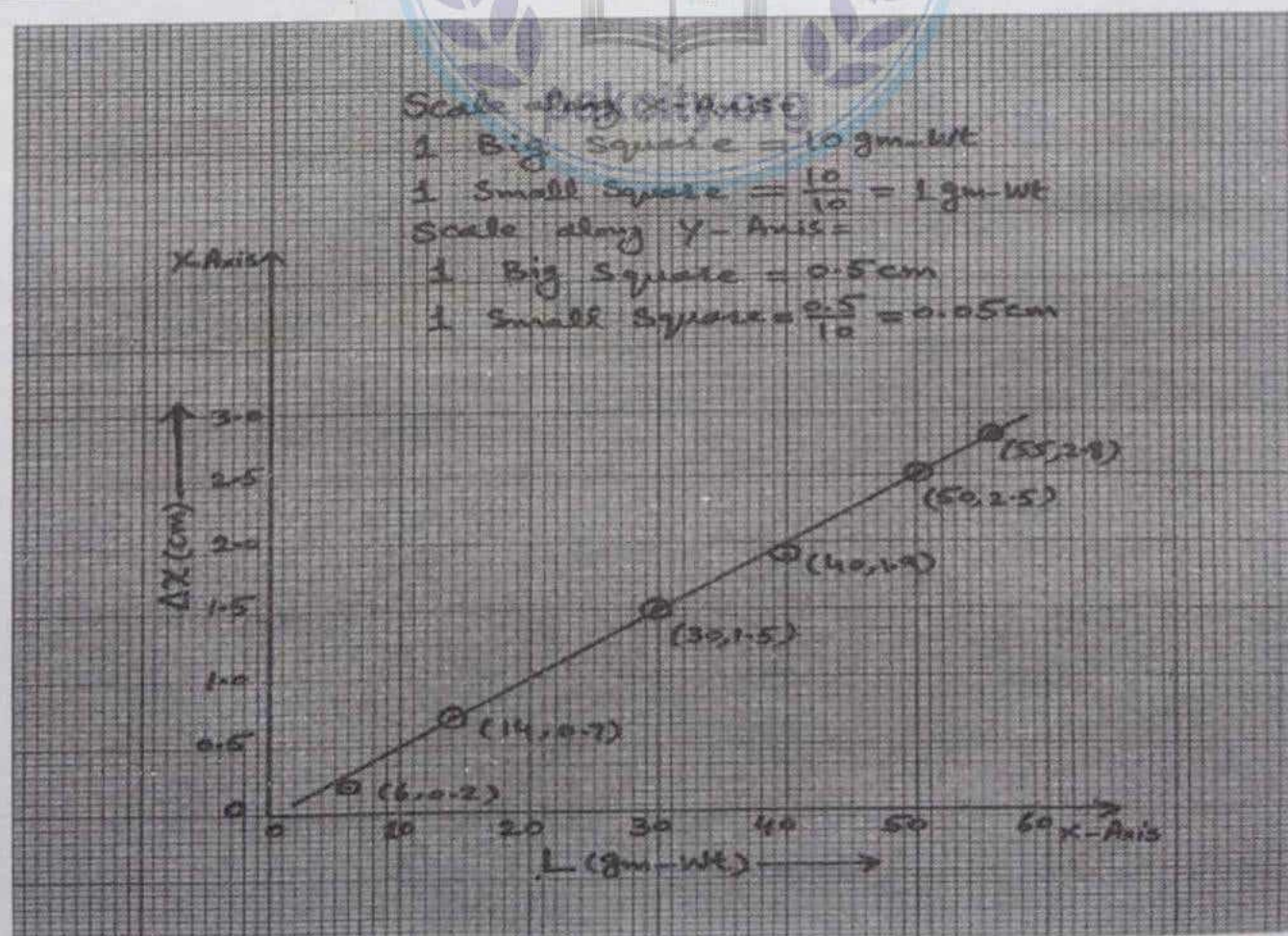
Q.4: Draw a graph between t and V .

t (s)	0.2	0.3	0.4	0.5	0.6	0.7
V (ms^{-1})	5.73	5.78	5.83	5.88	5.93	5.98



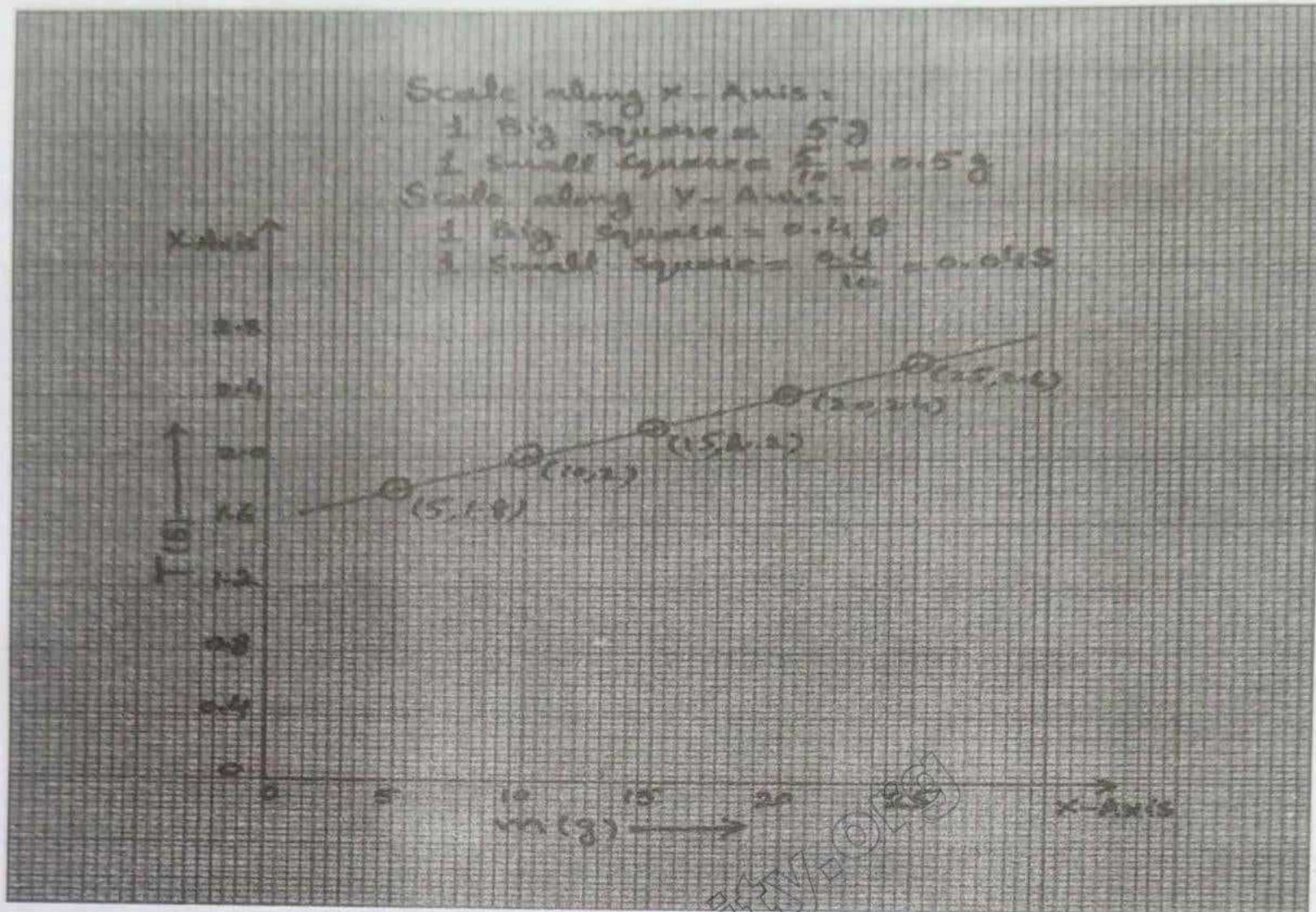
Q.5: Draw a graph between L and Δx .

L	6	14	30	40	50	55
Δx	0.2	0.7	1.5	1.9	2.5	2.8



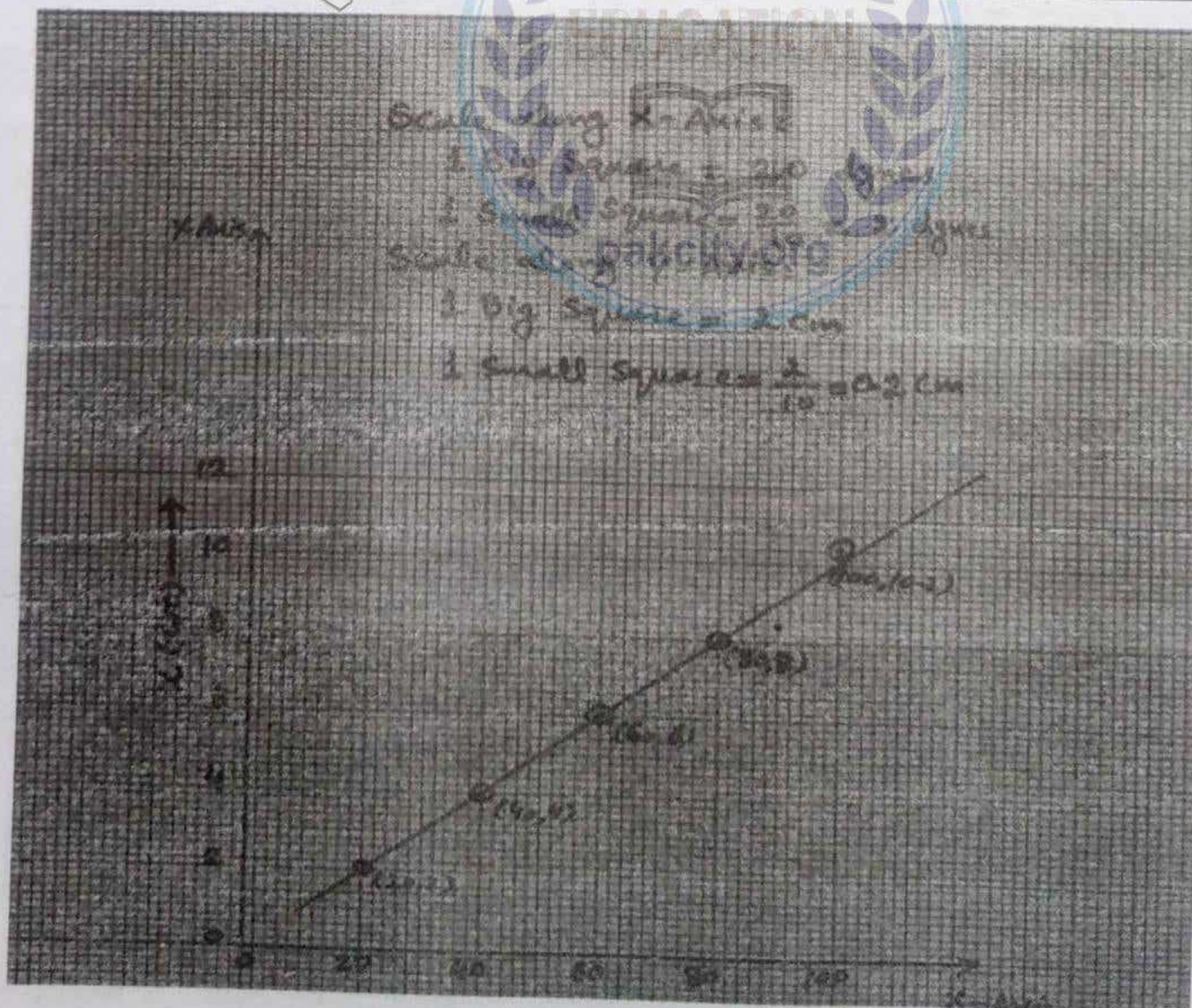
Q.6: Draw a graph between $m(g)$ and $T(s)$.

$m(g)$	5	10	15	20	25
$T(s)$	1.8	2	2.2	2.4	2.6



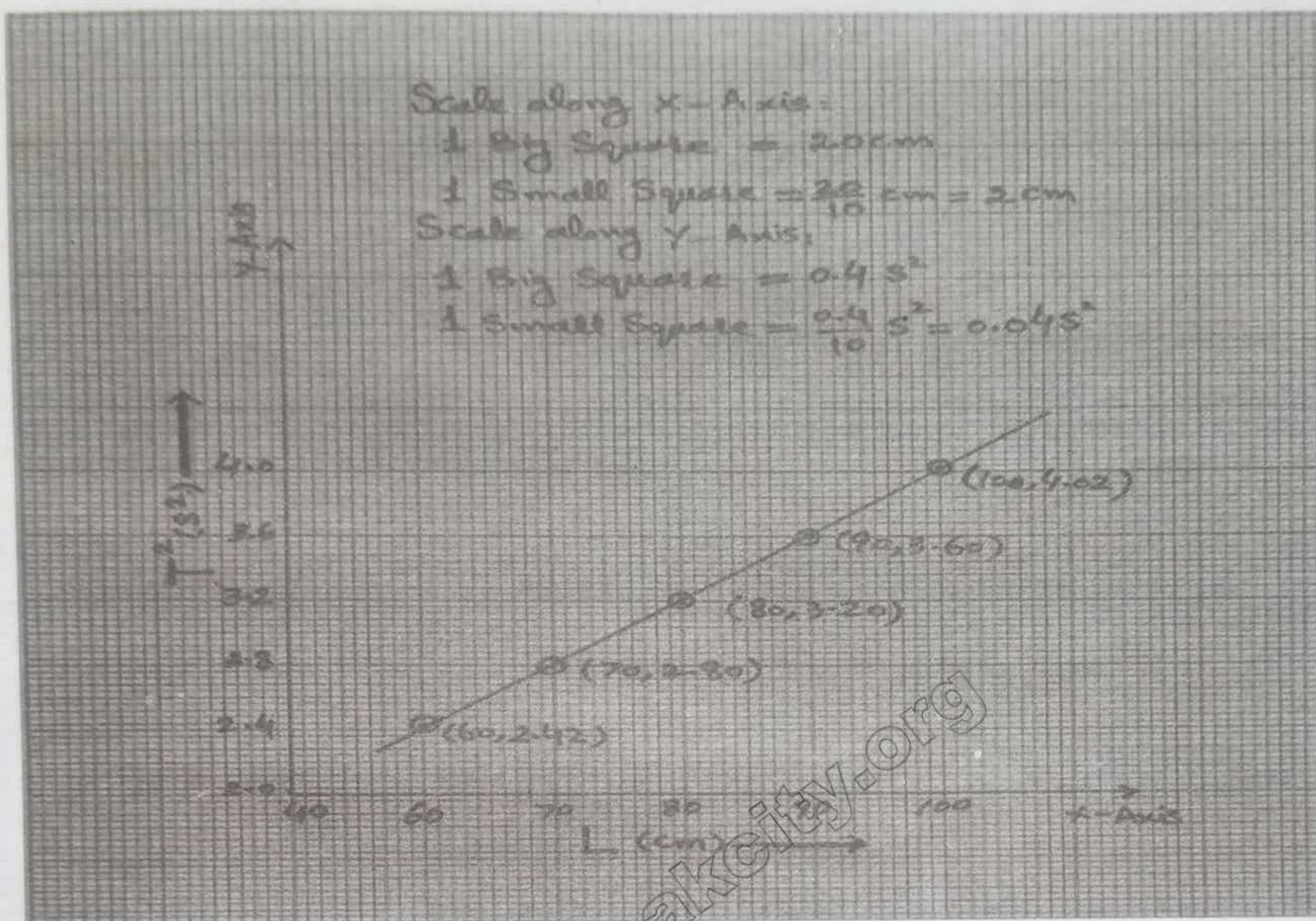
Q.6: Draw a graph between F and x .

$F(\text{dynes})$	20	40	60	80	100
$x(\text{cm})$	2	4	6	8	10.2



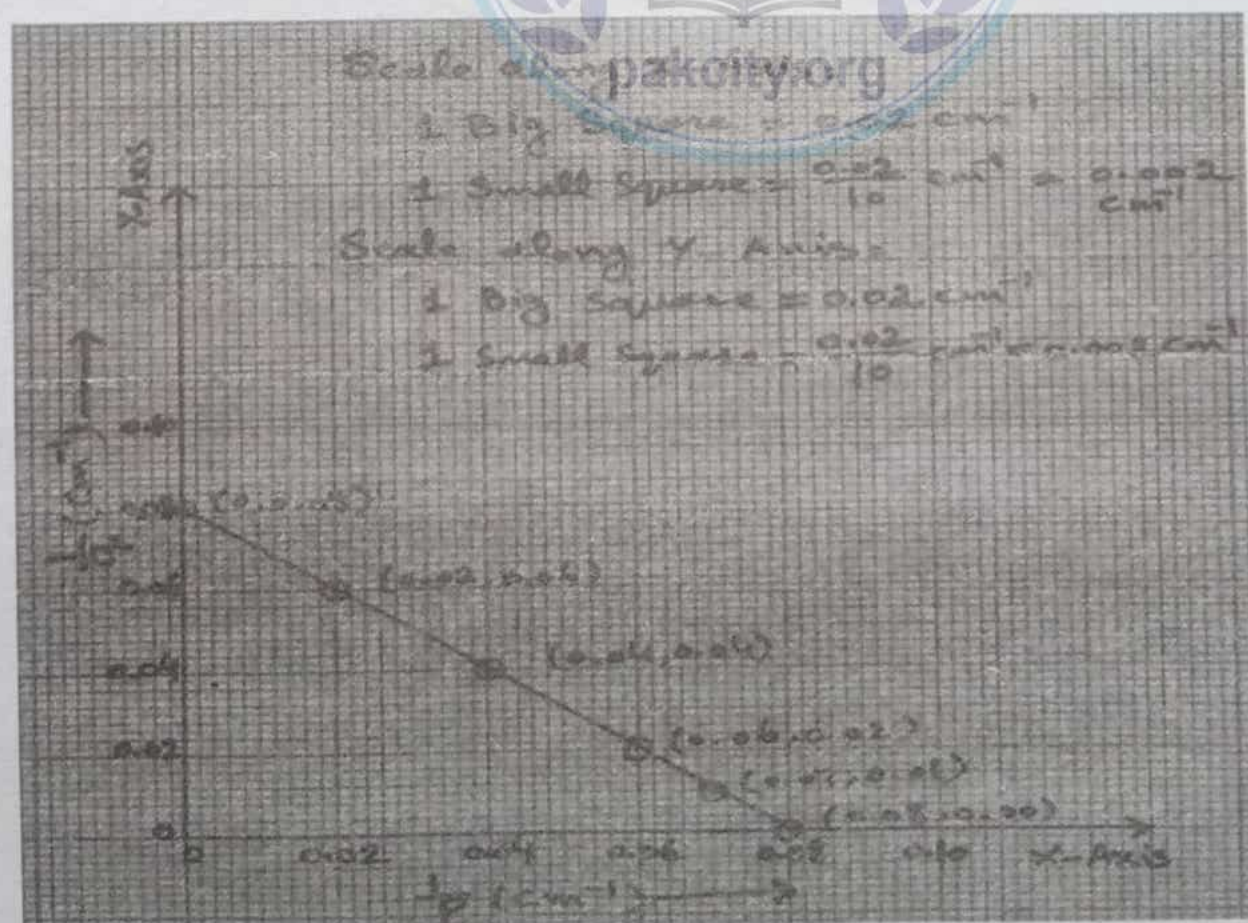
Q.7: Draw a graph between L and T².

L(cm)	60	70	80	90	100
T ² (S ²)	2.42	2.80	3.20	3.60	4.02



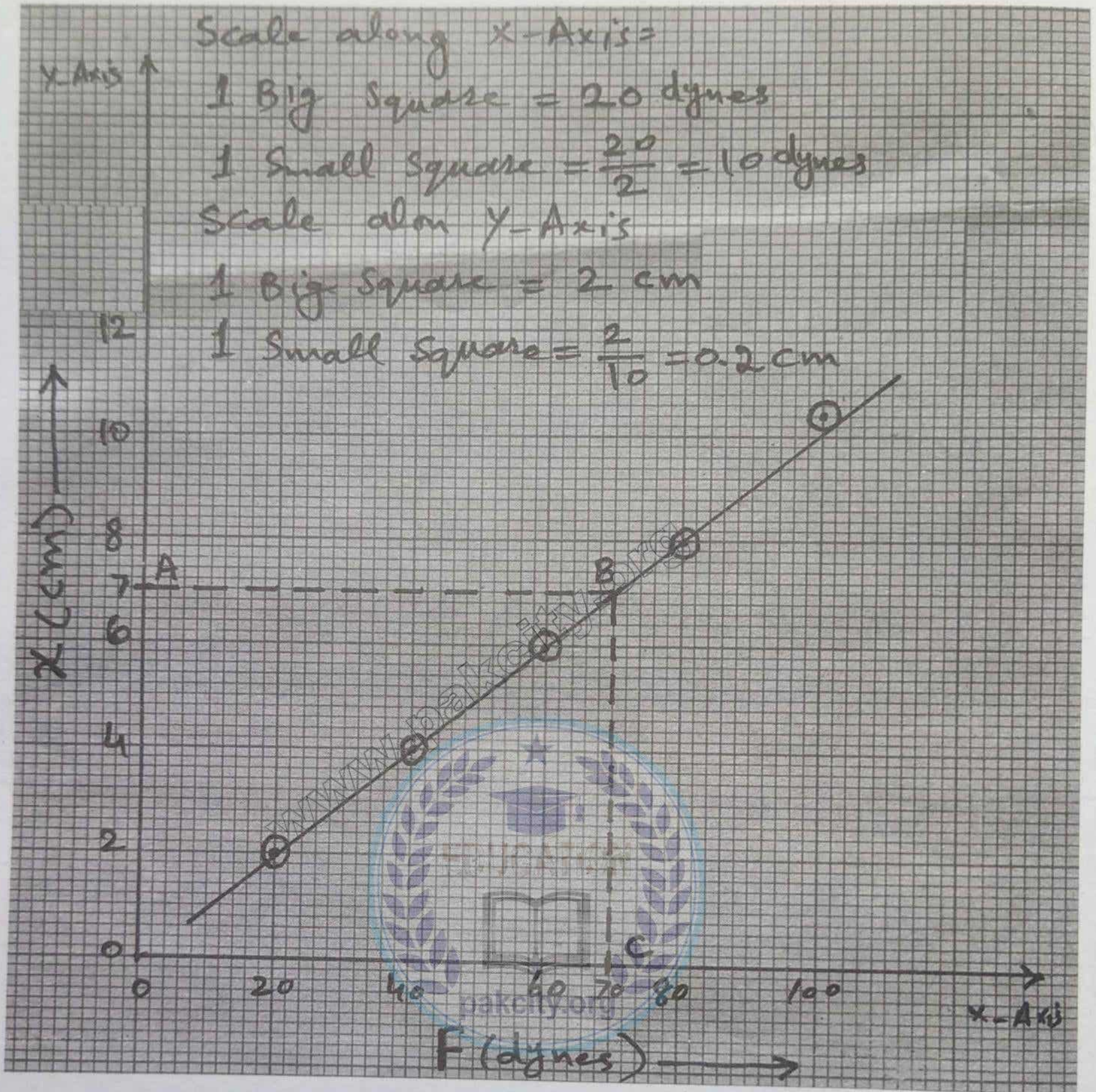
Q.8: Draw a graph between $\frac{1}{p}$ and $\frac{1}{q}$.

$\frac{1}{p}$ (cm ⁻¹)	0.08	0.07	0.06	0.04	0.02	0
$\frac{1}{q}$ (cm ⁻¹)	0.00	0.01	0.02	0.04	0.06	0.08



Q.9: Draw a graph between F and x.

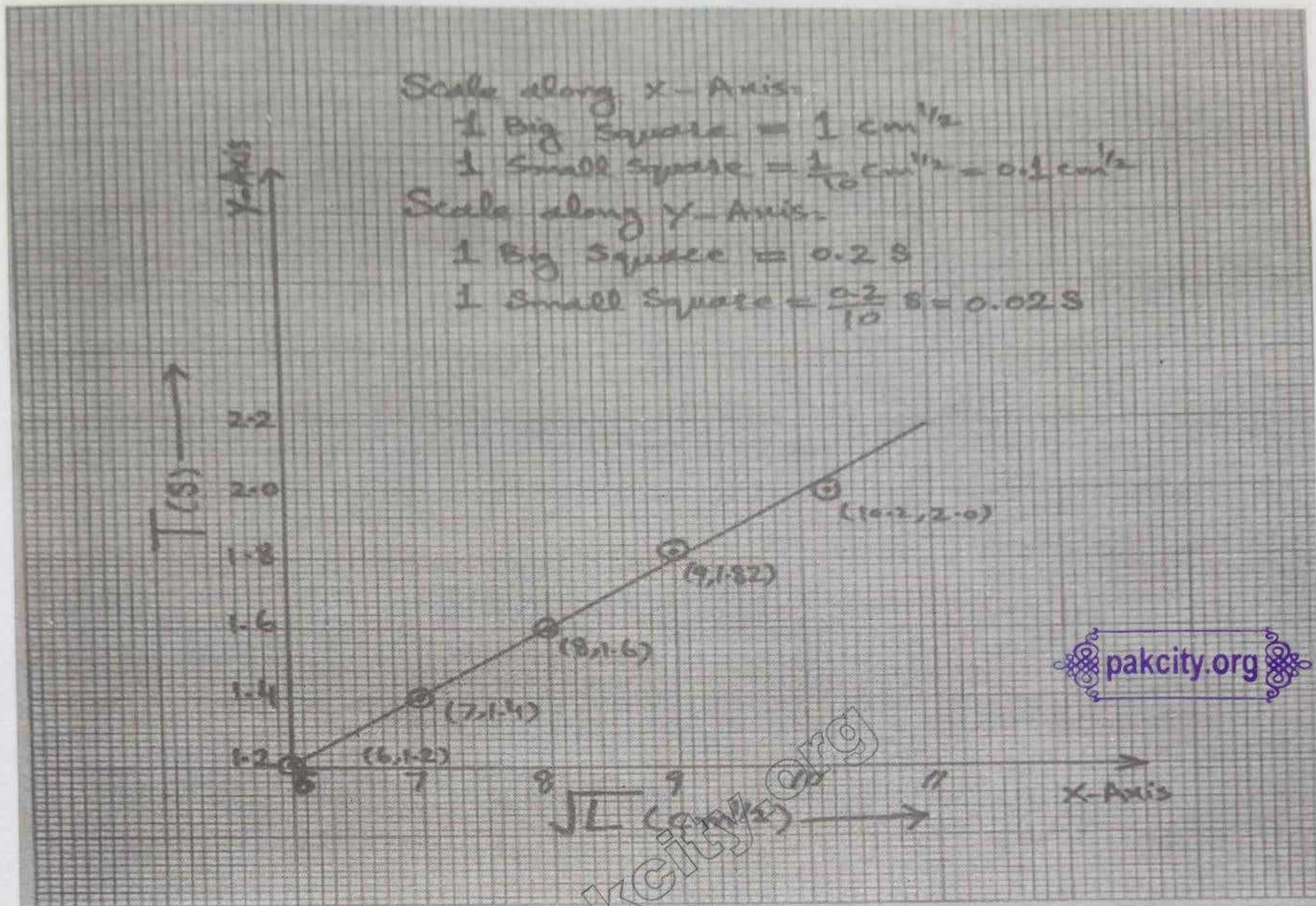
F(dynes)	20	40	60	80	100
x (cm)	2	4	6	8	10.2



If we are asked to find the value (or intercept) of force which produces 7 cm extension in the spring then from graph:
 extending dotted line from B to the x-axis, we find that 70 dynes force extends the spring upto 7 cm.

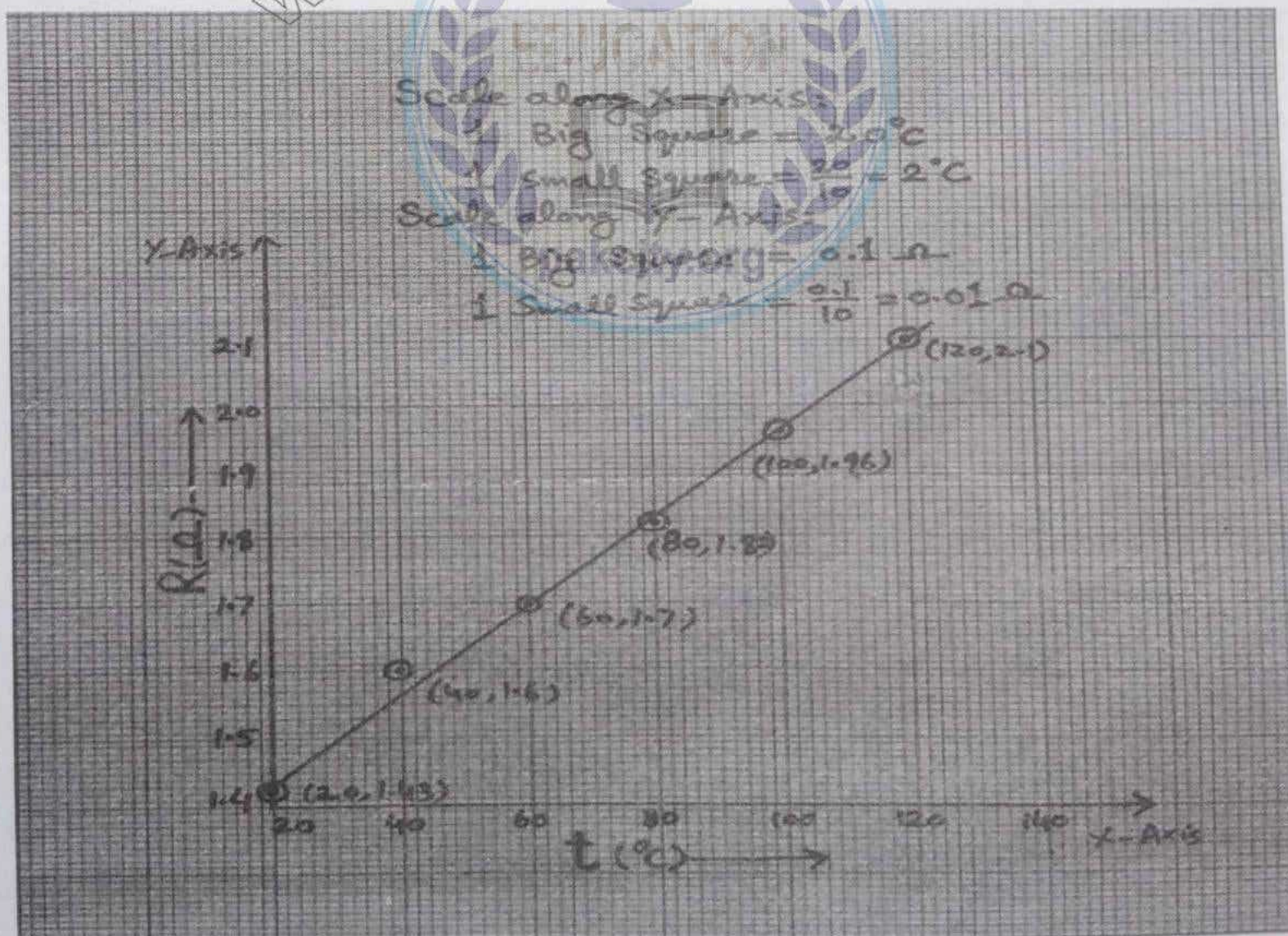
Q.10: Draw a graph between \sqrt{L} and T.

\sqrt{L} (cm ^{1/2})	6	7	8	9	10.2
T (s)	1.2	1.4	1.6	1.82	2.0



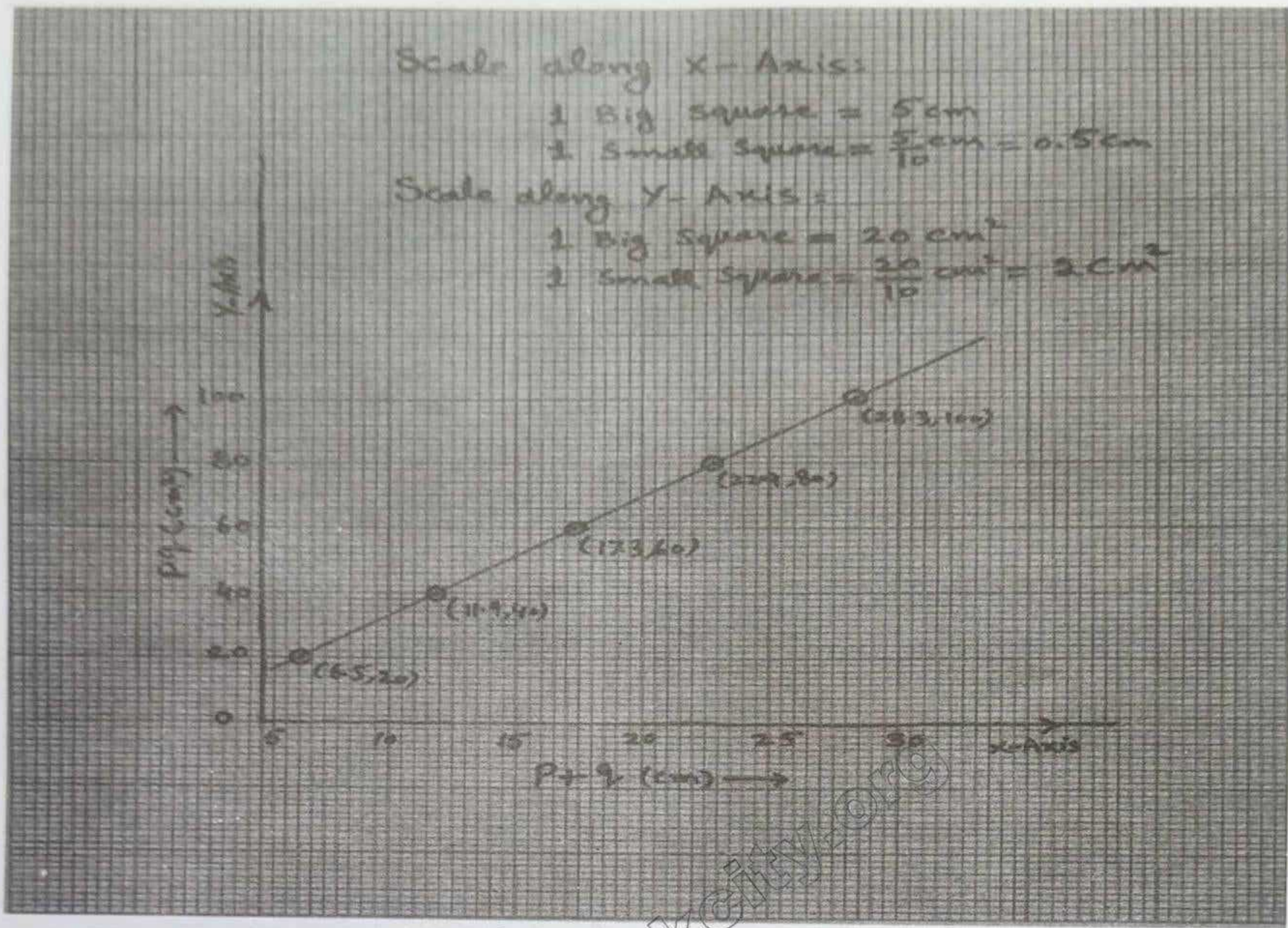
Q.11: Draw a graph between t and R.

t (°C)	20	40	60	80	100	120
R (Ω)	1.43	1.6	1.7	1.80	1.96	2.1



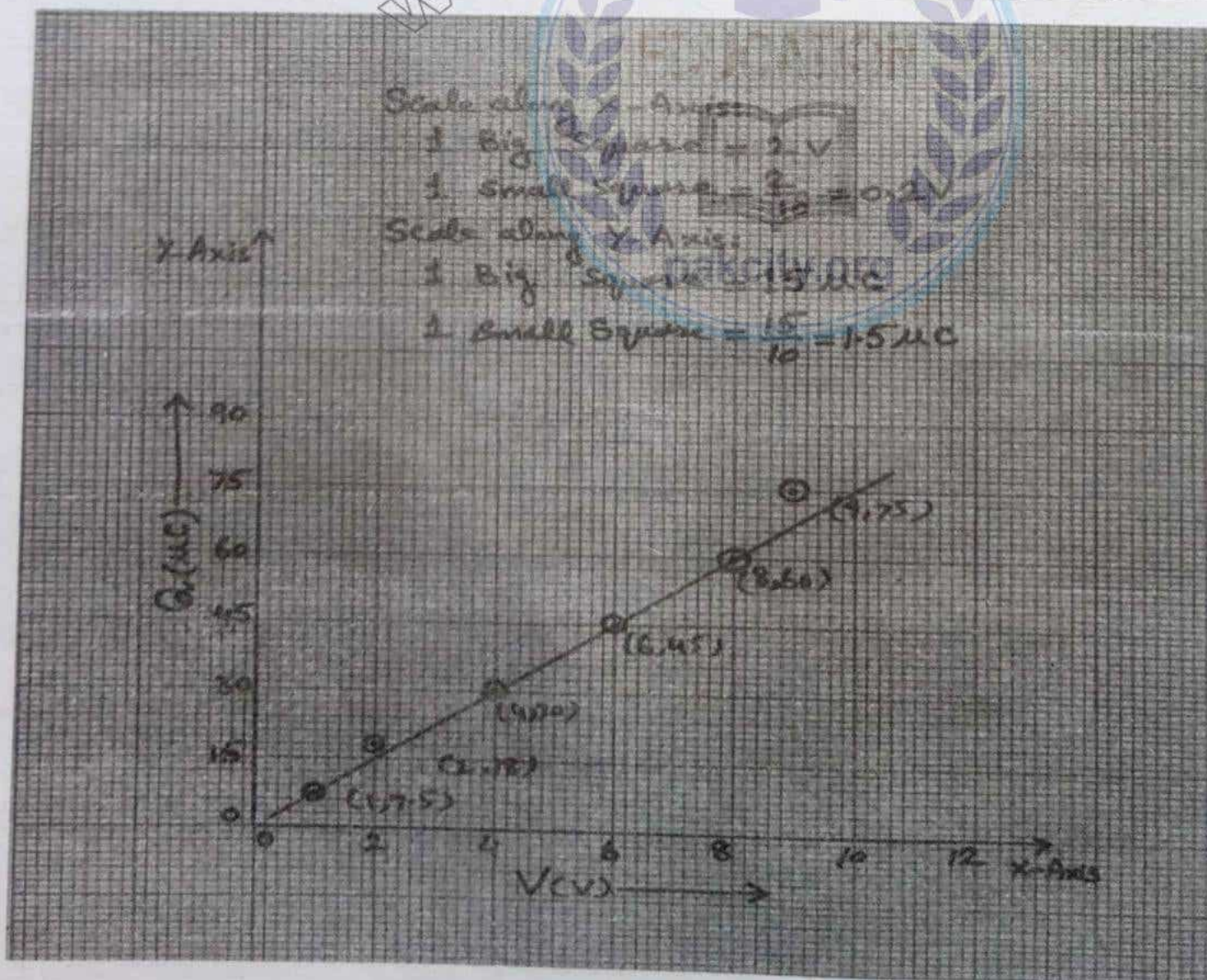
Q.12: Draw a graph between $p+q$ and pq .

$p + q$ (cm)	6.5	11.9	17.3	22.9	28.3
Pq (cm^2)	20	40	60	80	100



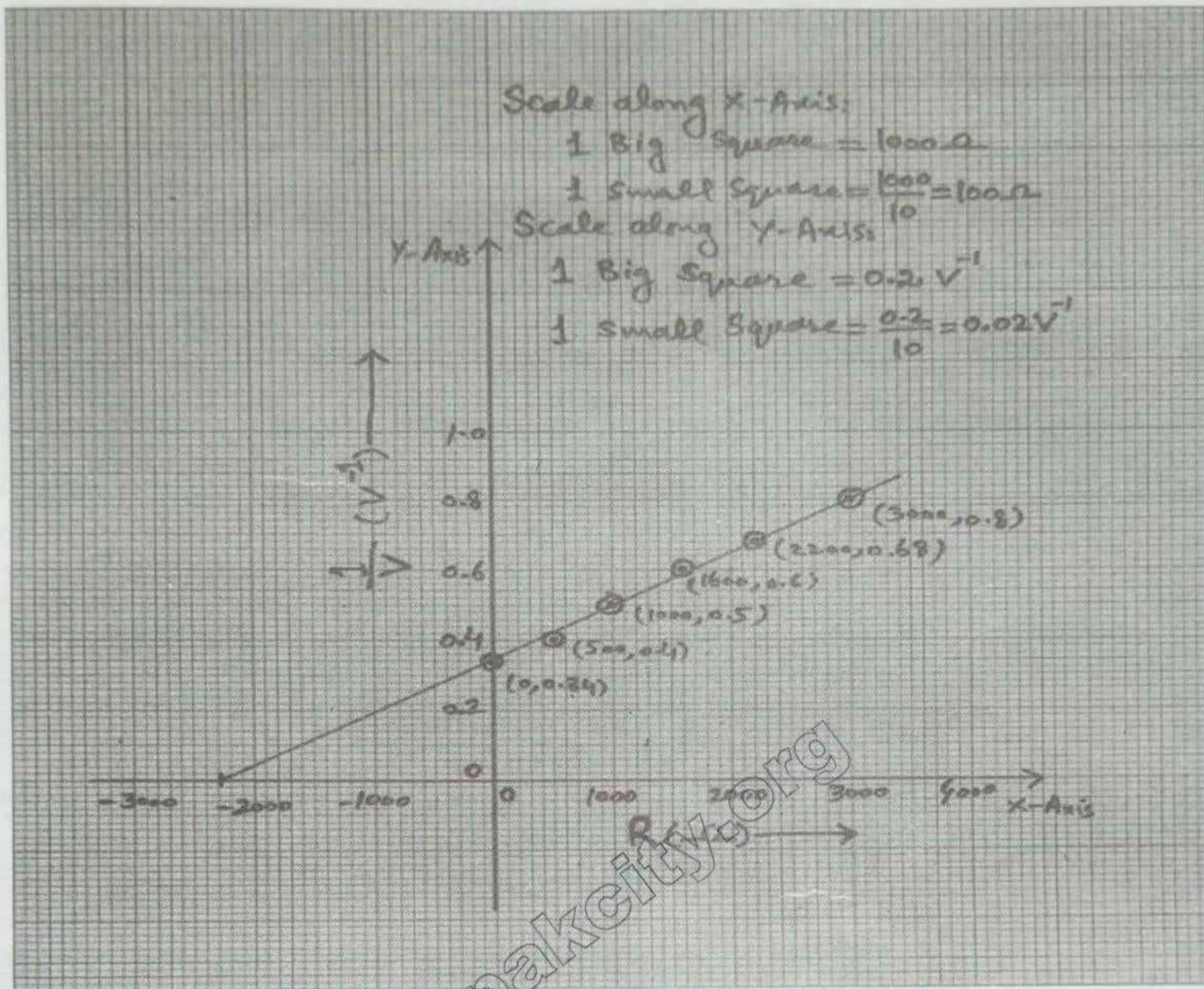
Q.13: Draw a graph between V and Q .

V (v)	1	2	4	6	8	9
Q (μC)	7.5	18	30	45	60	75



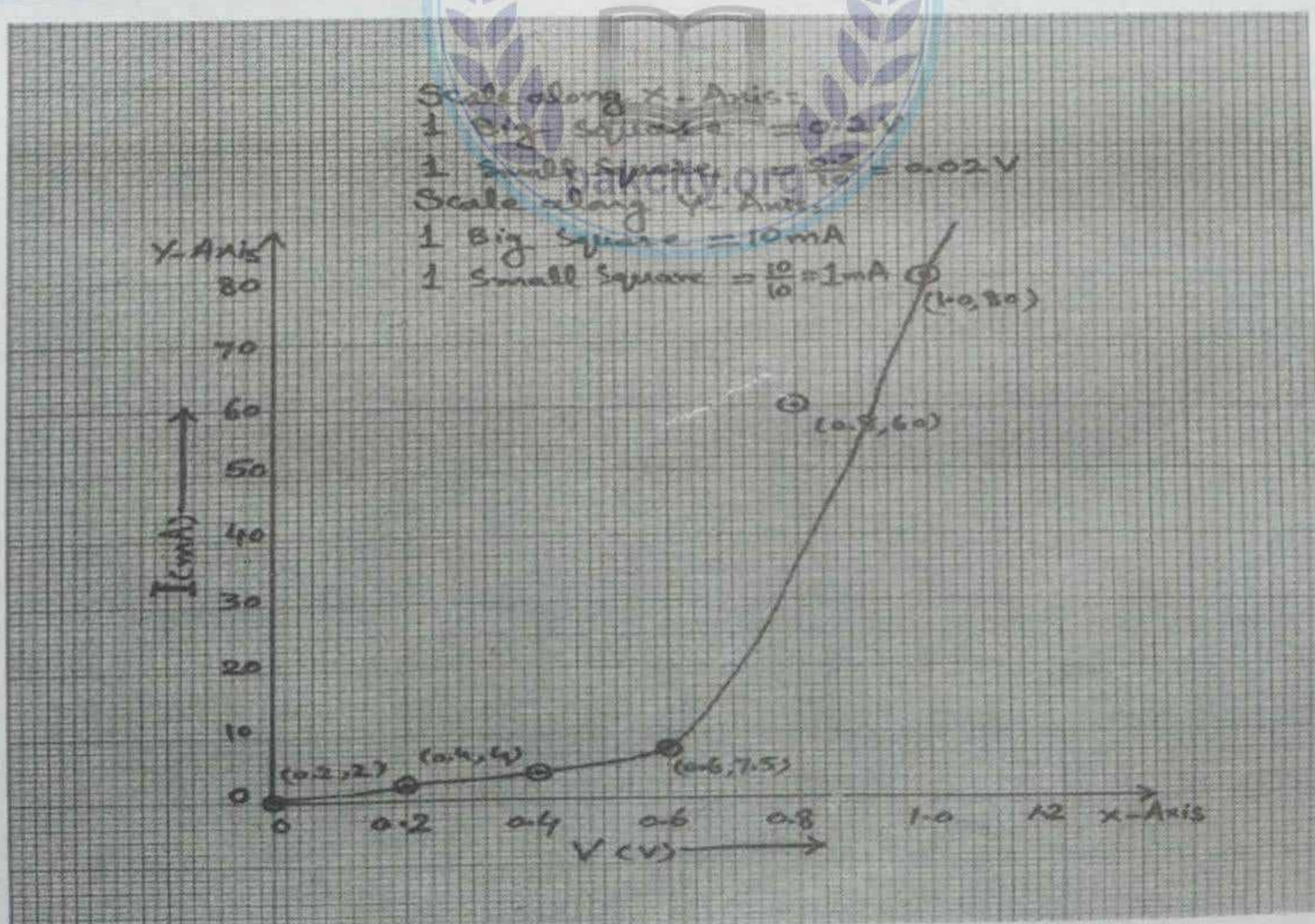
Q.14: Draw a graph between $R(\Omega)$ and $\frac{1}{V}(V^{-1})$.

V(v)	1	2	4	6	8	9
Q(μ C)	7.5	18	30	45	60	75



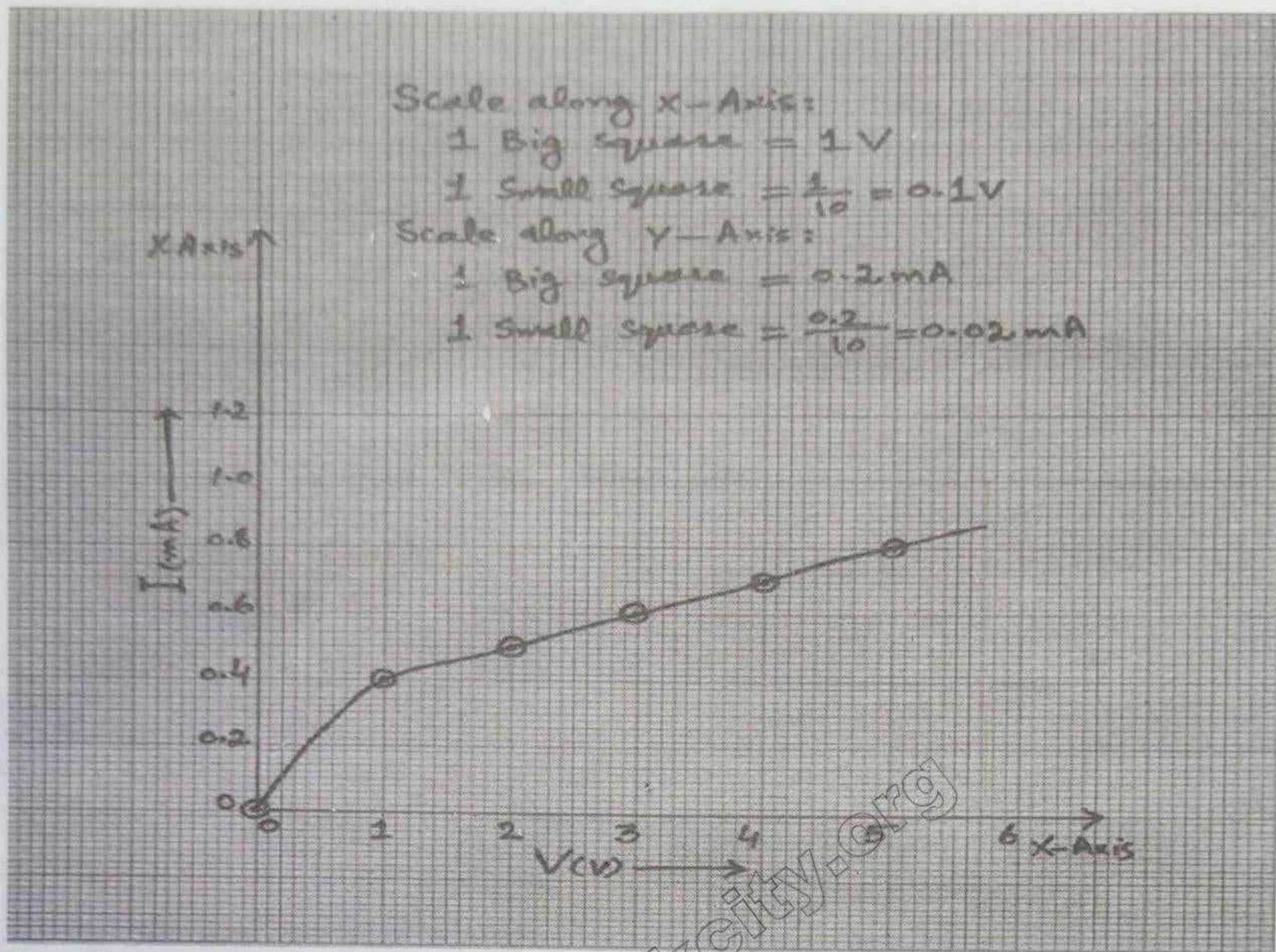
Q.15: Draw a graph between $R(\Omega)$ and $\frac{1}{V}(V^{-1})$.

V(v)	0.2	0.4	0.6	0.8	1.0
I (mA)	2	4	7.5	60	80



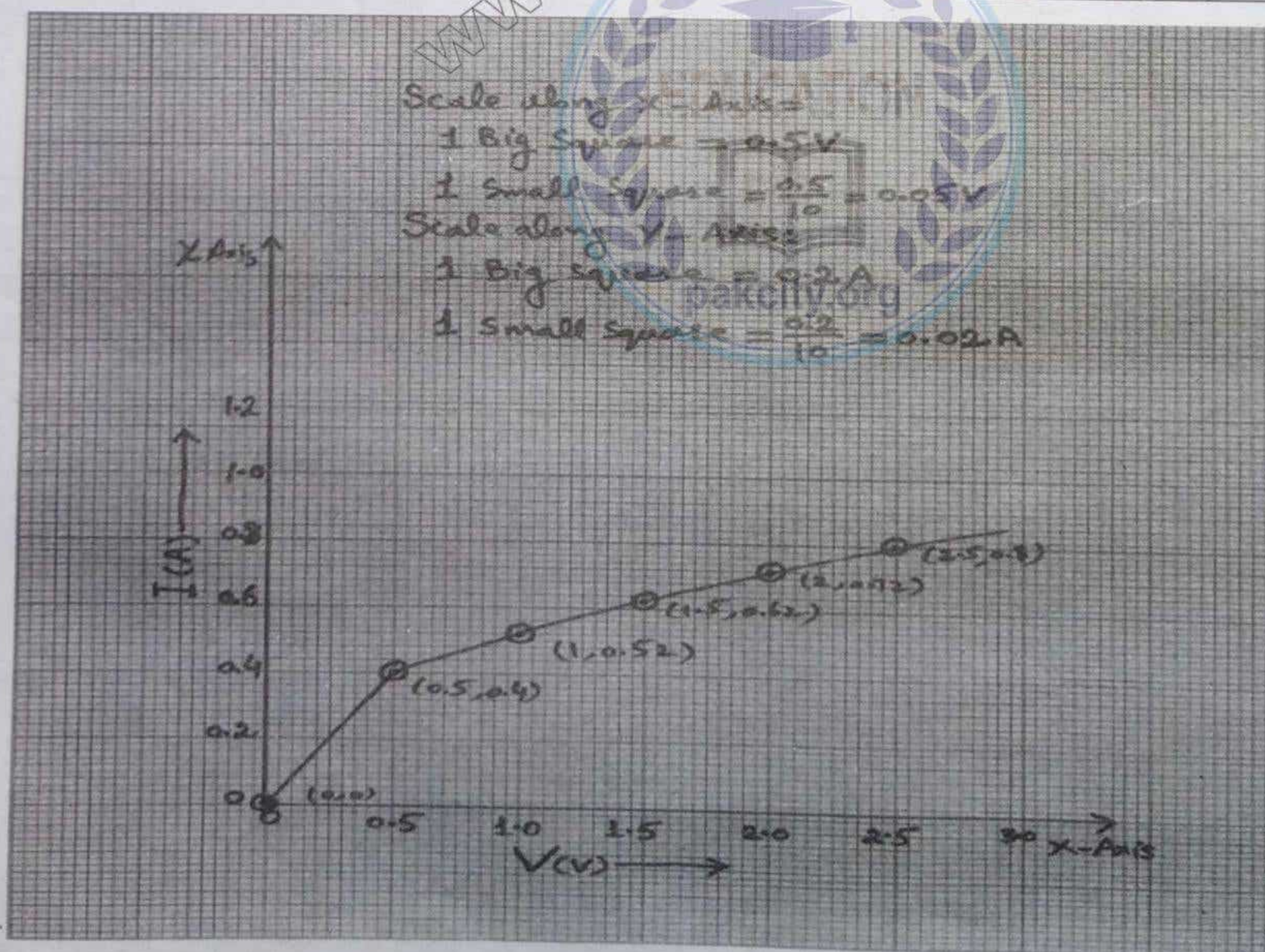
Q.16: Draw a graph between V and I.

V(v)	1	2	4	6	8	9
Q(μ C)	7.5	18	30	45	60	75



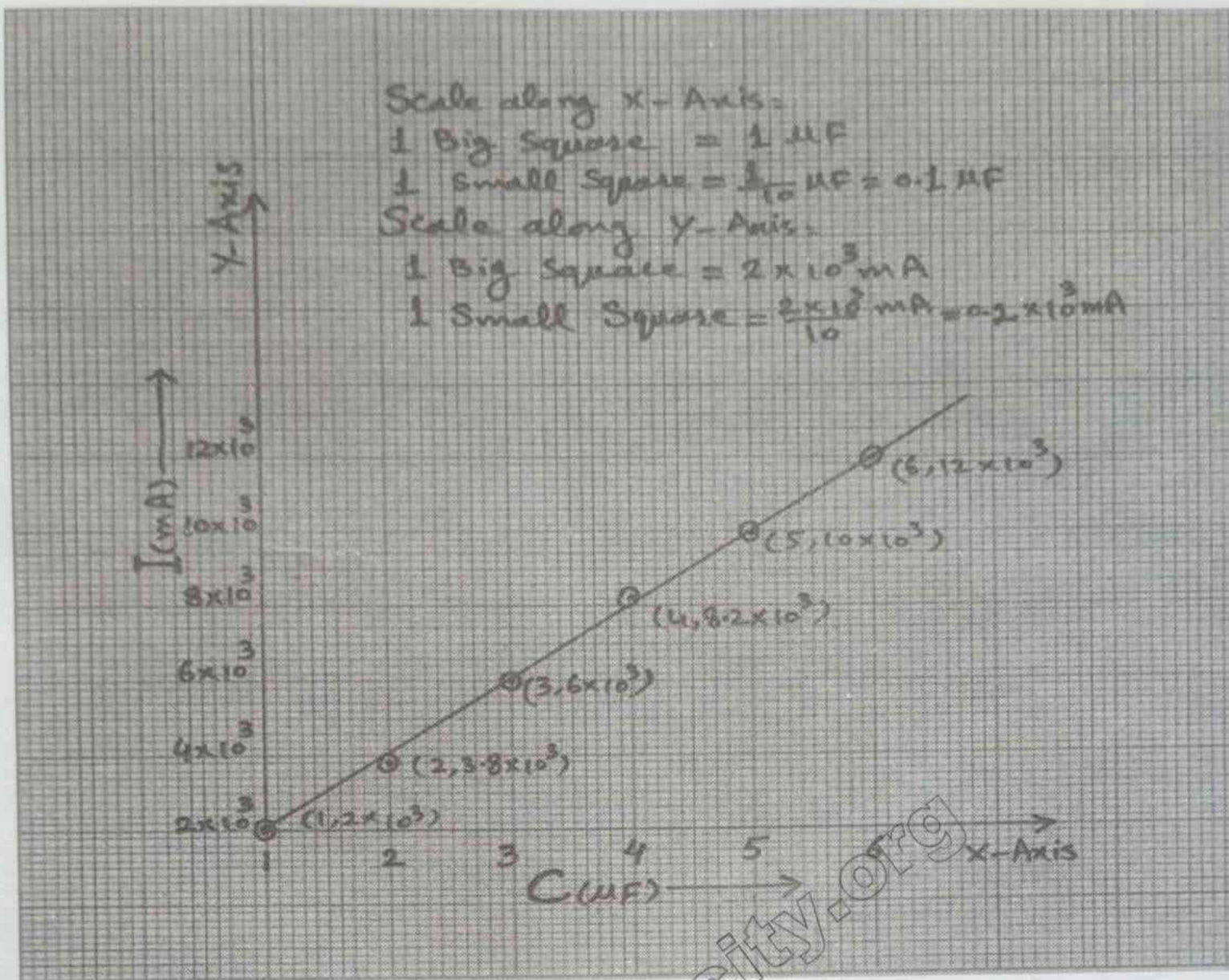
Q.17: Draw a graph between V and I.

V(v)	0	0.5	1	1.5	2	2.5
I(A)	0	0.4	0.52	0.62	0.72	0.8



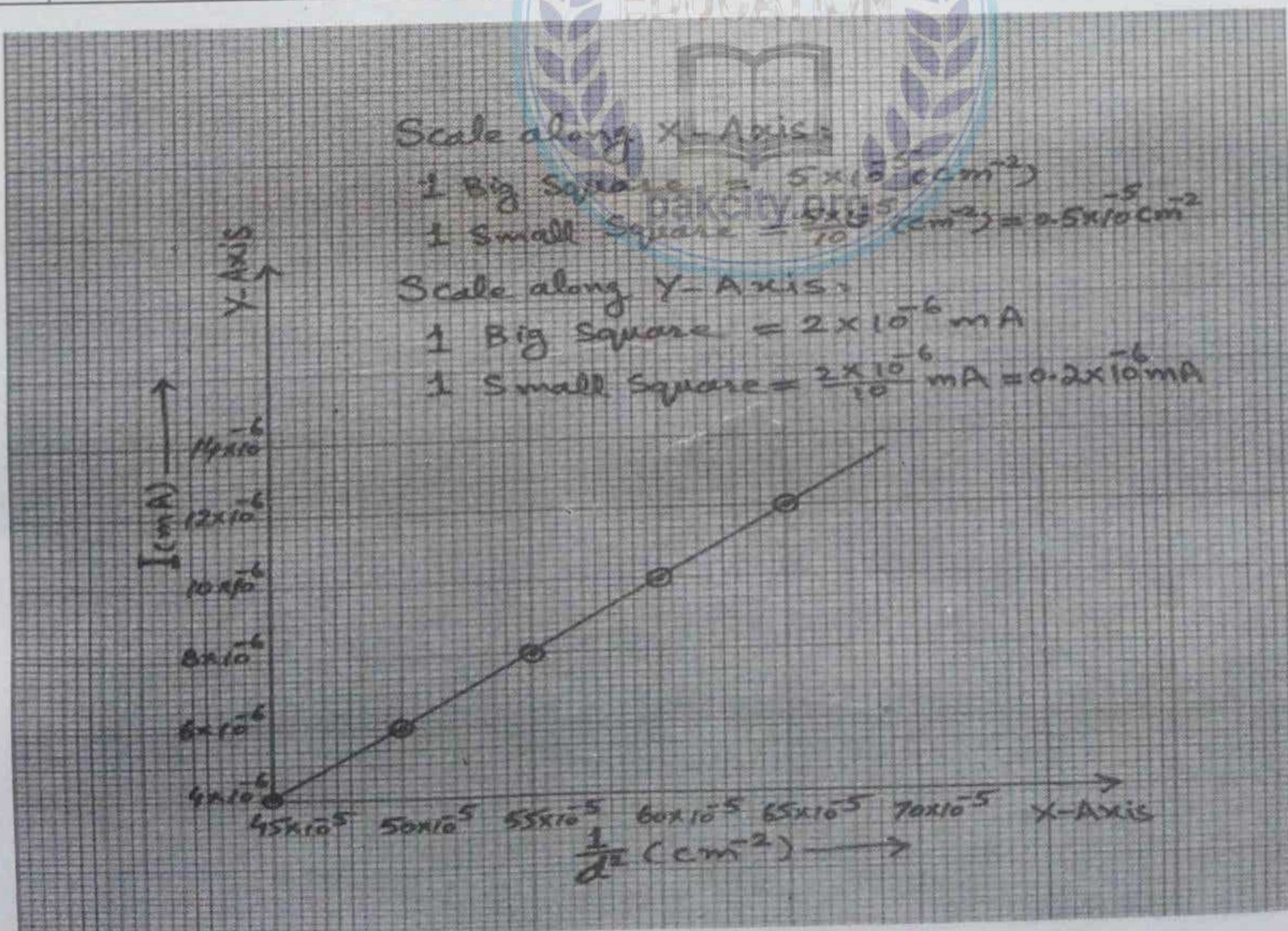
Q.18: Draw a graph between C and I.

C (μF)	1	2	3	4	5	6
I (A)	2×10^3	3.8×10^3	6×10^3	8.2×10^3	10×10^3	12×10^3



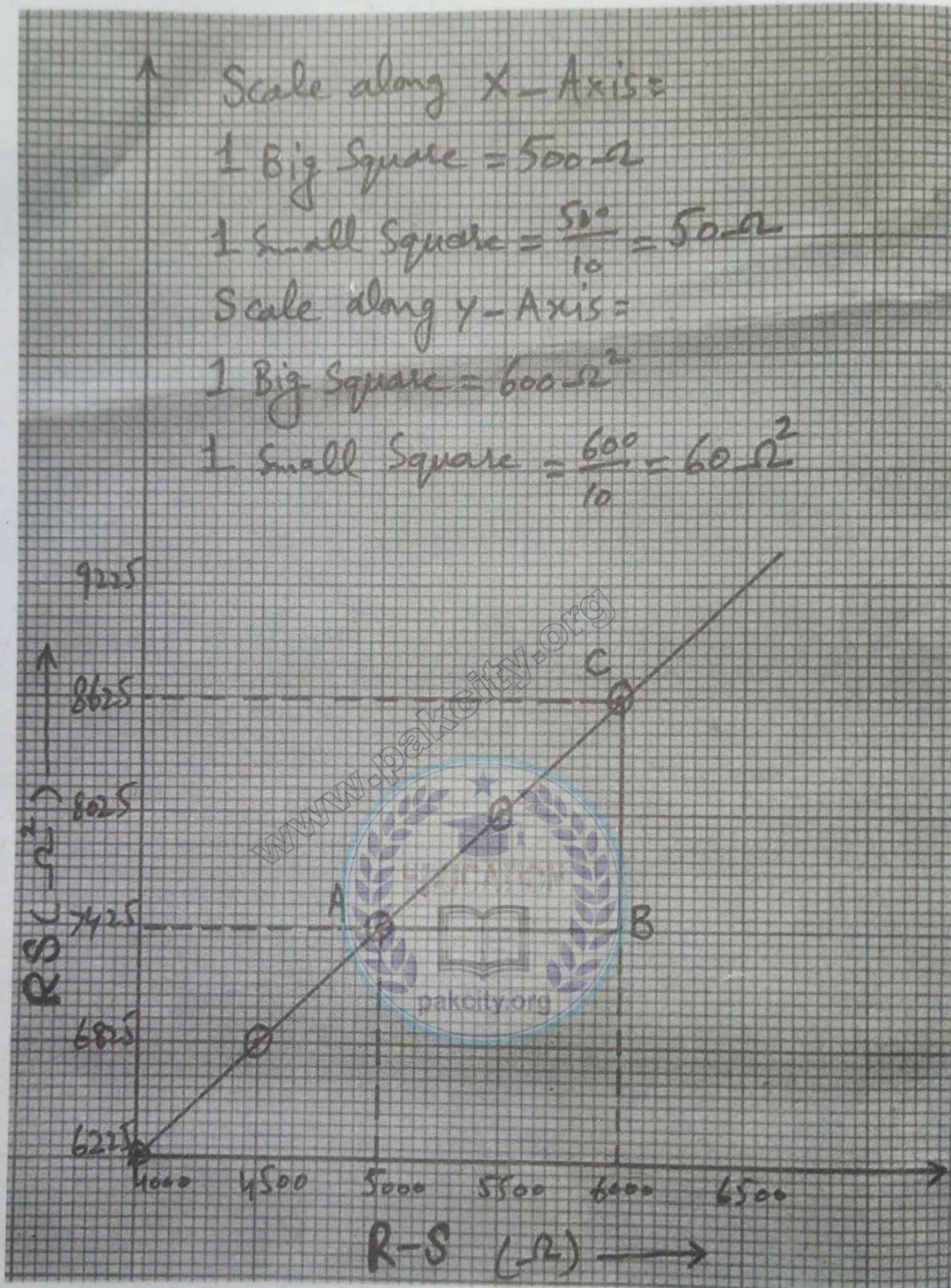
Q.19: Draw a graph between $\frac{1}{d^2}$ and I.

$\frac{1}{d^2} (cm^{-2})$	45×10^{-5}	50×10^{-5}	55×10^{-5}	60×10^{-5}	65×10^{-5}	70×10^{-5}
I (A)	4×10^{-6}	6×10^{-6}	8×10^{-6}	10×10^{-6}	12×10^{-6}	14×10^{-6}



Q.20: Draw a graph between $R - S(\Omega)$ and $RS(\Omega)$.

$R - S(\Omega)$	4000	4500	5000	5500	6000
$RS(\Omega)$	6225	825	7425	8025	8625



If we are asked to find the slope then we will solve as:

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x} = \frac{BC}{AB} = \frac{RS}{R-S} = \frac{8625 - 7425}{6000 - 5000} = \frac{1200}{1000} = 1.2 \Omega$$

Which is the internal resistance of galvanometer "G"

Q.21: Draw a graph between $R - S(\Omega)$ and $RS(\Omega)$.

$C(\mu F)$	0.1	0.15	0.2	0.25	0.3	0.35
$I(mA)$	4	6	8	10	12	14

