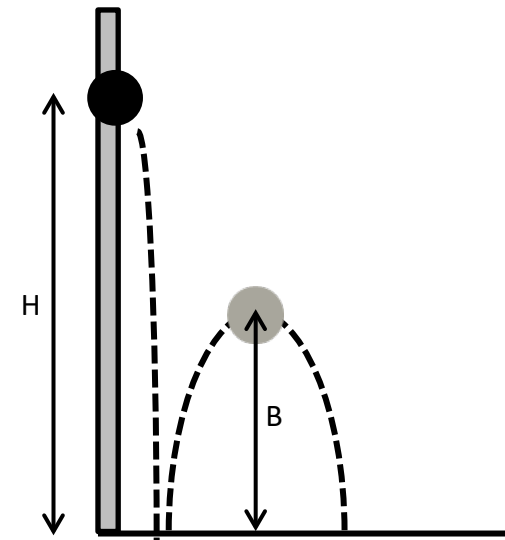


Physics 90935:

Carry out a practical investigation that leads to a linear mathematical relationship, with direction

Plot this data as a line graph. Put drop height on the x-axis and rebound height on the y-axis.

| Drop height H (cm) | Average rebound height B (cm) |
|--------------------|-------------------------------|
| 20 | 13 |
| 40 | 25 |
| 60 | 33 |
| 80 | 55 |
| 100 | 64 |
| 120 | 80 |
| 140 | 95 |
| 160 | 106 |

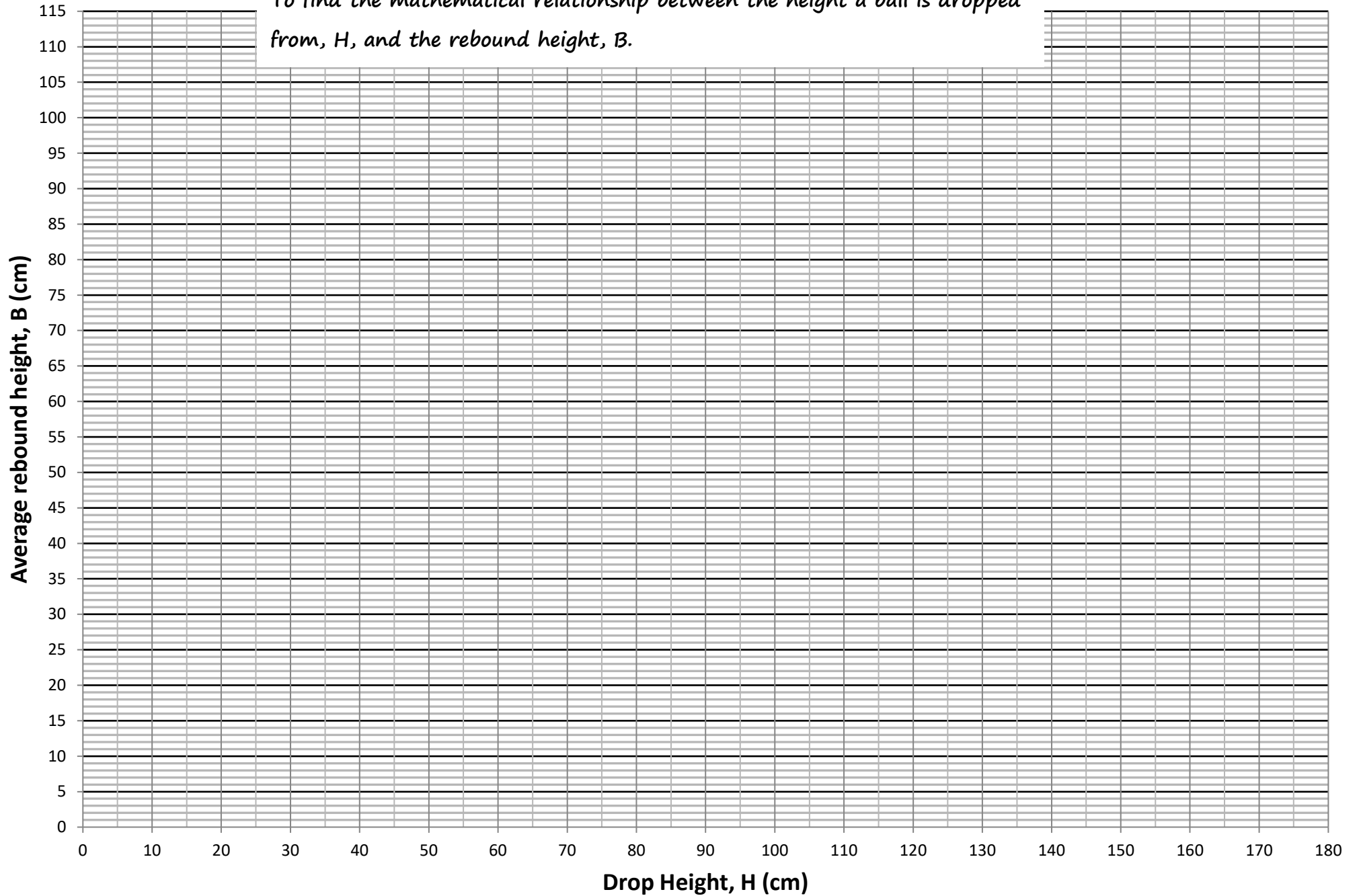


Draw a line of best fit through the 8 points.

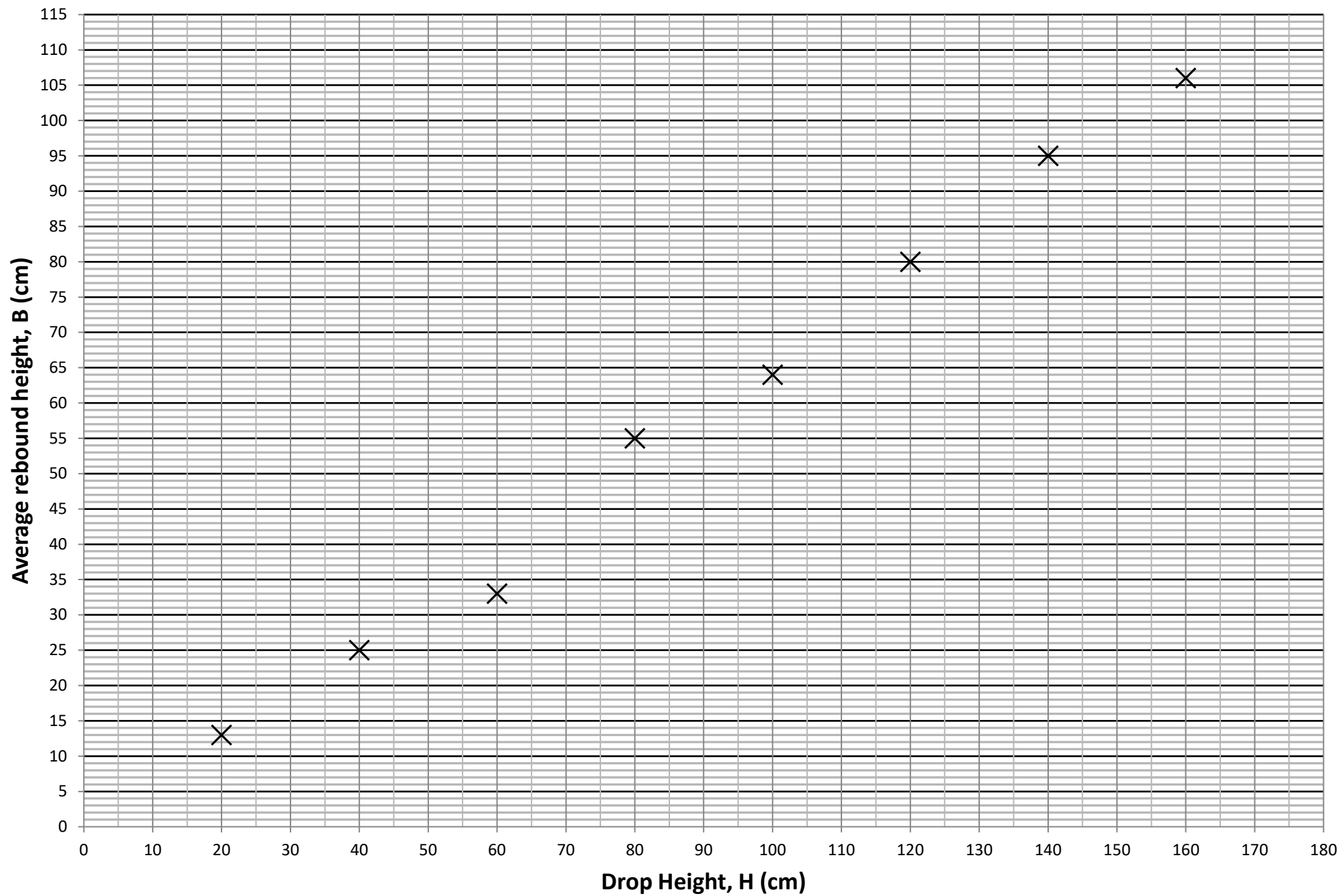
Calculate the gradient.

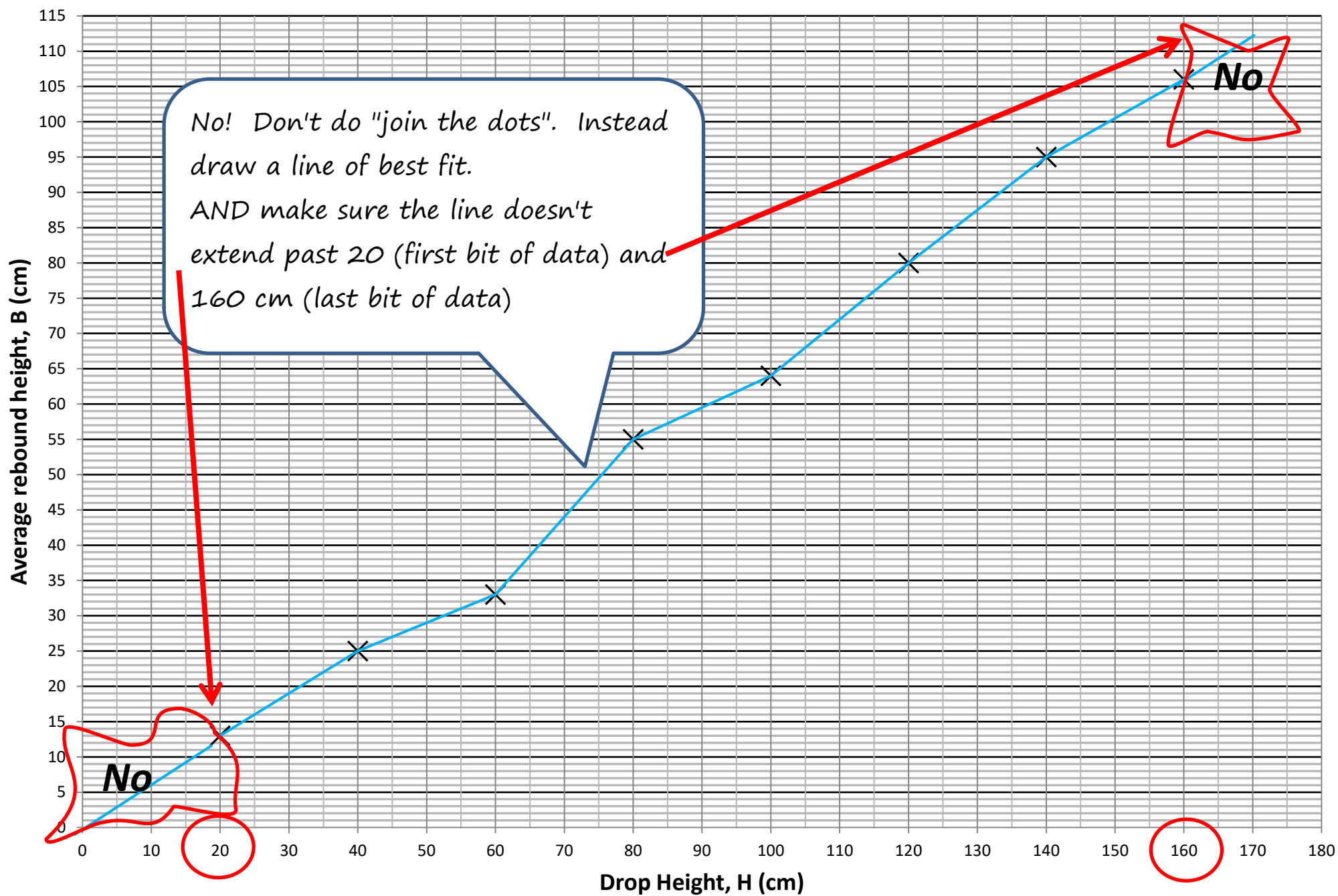
What are the units of the gradient? Does this gradient have units? Why/why not?

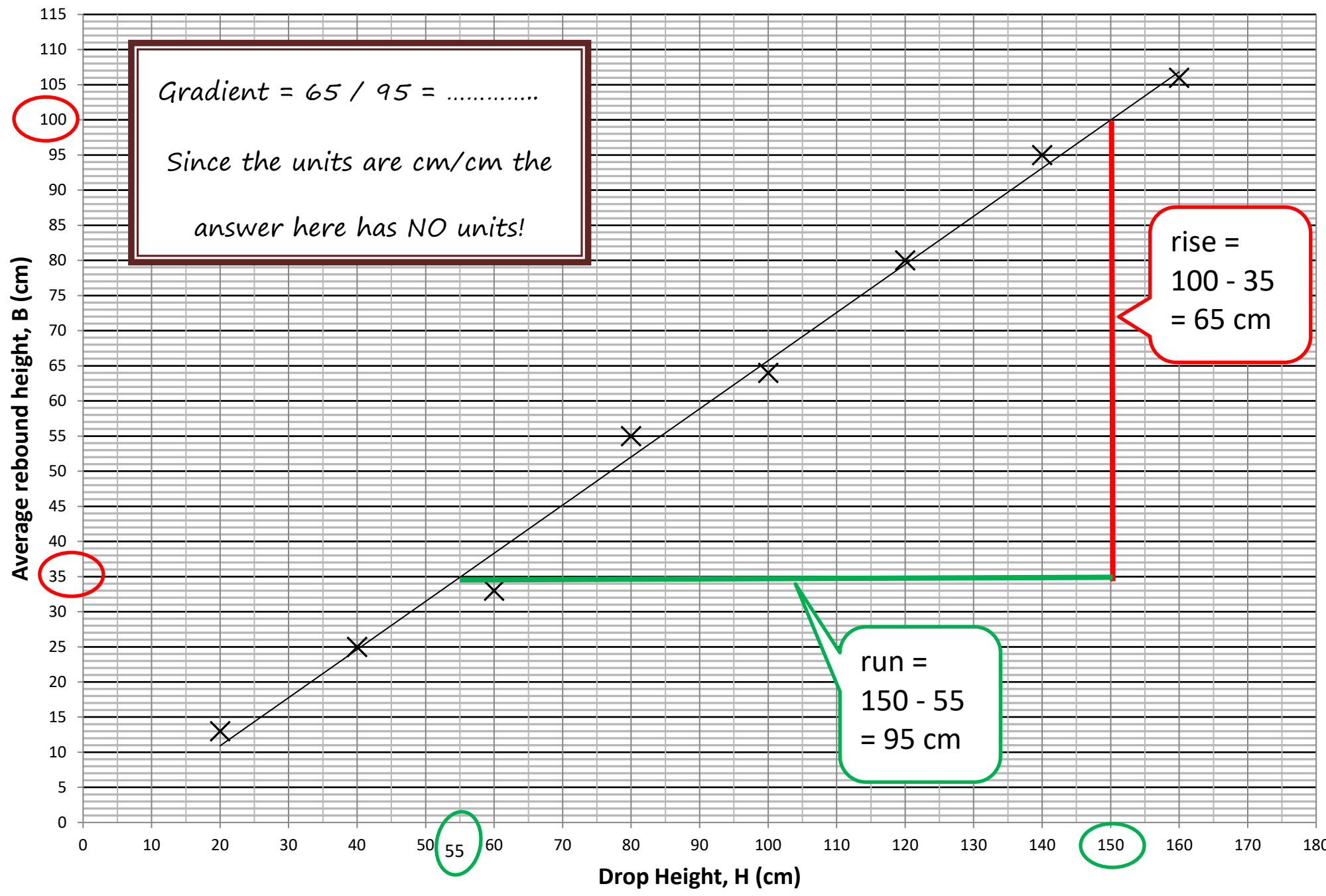
To find the mathematical relationship between the height a ball is dropped from, H, and the rebound height, B.



✕ No Brain Too Small ● PHYSICS ✕







Draw a straight line of best fit with a ruler, trying to get as many points above the line as below – and leaving out any really obvious outliers (anomalous results). Select 2 points on the graph that fall on points on the graph paper those are easy to read.

- Calculate the rise and the run.
- Calculate the gradient; rise \div run.

State the mathematical equation of the relationship between the independent and dependent variables.

The gradient of a straight line is given by the equation $y = mx + c$, where m is the gradient. (c is the intercept but we are not interested in this for this AS)

Don't use y and x but instead substitute the labels for the variables, here B and H .

$$y = m x$$
$$B = 0.68 H$$

Accuracy improving:

- Line up eye with ball and measuring device to reduce parallax errors.
- Difficult to estimate the maximum height a moving tennis ball rebounds to so do lots of measurements.

Independent variable range:

- Minimum dropping height was <insert height> because a dropping height less than this gave too small a rebound height that could not be measured.
- Maximum dropping height was <insert height> because too difficult to do accurately in a science lab.

Controlled variable:

- Same tennis ball used each time because different balls could bounce by different amounts.
- Ball dropped on to same surface (carpet square) as balls could bounce by different amounts on different surfaces.

Difficulties / issues:

- Rebound height very difficult to measure as ball only stops momentarily before falling again.