

Transformed graphs, stating their relationship

Homework exercise

a. 1. The time of fall is directly proportional to the square root of the height fallen.

2. Points used to determine gradient $(x_1, y_1) = (0, 0)$
 $(x_2, y_2) = (5.48, 2.5)$

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{2.5 - 0}{5.48 - 0} \\ &= 0.4562... \end{aligned}$$

$$\text{unit for the gradient} = \frac{\text{unit on y axis}}{\text{unit on x axis}}$$

$$= \frac{s}{m^{1/2}}$$

$$= sm^{-1/2}$$

the gradient for the falling mass is $0.46 sm^{-1/2}$

3. The intercept is 0s

4. dependent axis is t
independent axis is $d^{1/2}$

gradient is $0.46 sm^{-1/2}$

intercept is 0s

$$y = mx + c$$

$$t = (0.46 sm^{-1/2})d^{1/2} + 0$$

the mathematical relationship for the falling mass

is $t = (0.46 sm^{-1/2})d^{1/2}$