

Transformed graphs, stating their relationship

Homework exercise

- d. 1. The light intensity is directly proportional to the inverse square of the distance.
2. Points used to determine the gradient $(x_1, y_1) = (0, 0)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (x_2, y_2) = (25, 240)$$
$$= \frac{240 - 0}{25 - 0}$$
$$= 9.6$$

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

$$= \frac{\text{lumens}}{m}$$

the gradient for the fading light beam is $9.6 \text{ lumens.m}^{-1}$

3. the intercept is 0 lumens

4. dependent axis is d^{-2}

independent axis is I

gradient is $9.6 \text{ lumens.m}^{-1}$

intercept is 0 lumens

$$y = mx + c$$

$$I = (9.6 \text{ lumens.m}^{-1}) d^{-2} + 0$$

the mathematical relationship for the light beam is

$$I = (9.6 \text{ lumens.m}^{-1}) d^{-2}$$