Gradient - homework exercise

(a) "Brass"

Points used to determine gradient $(x_1, y_1) = (0,0)$

$(x_2, y_2) = (52, 6.1 \times 10^{-3})$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{(6.1 \times 10^{-3}) - 0}{52 - 0}$$

$$m = 1.1730769... \times 10^{-4}$$

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

$$= \frac{L}{g}$$

the gradient for the brass is $1.2 \times 10^{-4}\ L g^{-1}$ (2 sig. fig.)

(b) "Extending a spring"

Points used to determine gradient $(x_1, y_1) = (0,0)$

$(x_2, y_2) = (500, 250)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{250 - 0}{500 - 0}$$

$$m = 0.500$$

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

$$= \frac{mm}{g}$$

the gradient for the extending spring is $0.500\ mm\,g^{-1}$ (3 sig. fig.)