Describing a relationship – homework exercise

(a) "Brass"

The volume of brass is directly proportional to its mass.

$$V \propto m$$

dependent axis = V

independent axis = m

gradient = $1.2 \times 10^{-4}\ L g^{-1}$

intercept = $0.0\ L$

$$y = mx + c$$

$$V = (1.2 \times 10^{-4})m + 0$$

the mathematical relationship for the brass is,

$$V = (1.2 \times 10^{-4})m$$

(b) "Extending a spring"

The extension of the spring is directly proportional to the mass loaded on it.

$$x \propto m$$

dependent axis = x

independent axis = m

gradient = $0.500\ mm\ g^{-1}$

intercept = $0.000\ mm$

$$y = mx + c$$

$$x = (0.5)m + 0$$

the mathematical relationship for the extending spring is,

$$x = \frac{m}{2}$$