

DENSITY

1. Calculate the density of a liquid, 12.65 ml of which has a mass of 14.30 g.

$$\text{Density} = \frac{\text{mass}}{\text{volume}} = \frac{14.30 \text{ g}}{12.65 \text{ mL}} = \underline{1.130 \text{ g/mL}} \quad (4 \text{ sig. figs.})$$

2. 25.00 ml of ethanol (density 0.790 g/ml) is added to a graduated cylinder that has a mass of 44.28 g. What is the mass of the cylinder plus the ethanol?

$$\text{mass} = \text{volume} \times \text{density}$$

$$25.00 \text{ mL} \times 0.790 \text{ g/mL} = 19.75 \text{ g ethanol}$$

$$\text{total mass} = 44.28 \text{ g} + 19.75 \text{ g} = 64.03 \text{ g}$$

The mass is 64.0 g (3 sig. figs)

3. What is the volume of a piece of pure sulphur (density 2.07 g/ml) having a mass of 130.00 g?

$$\text{Vol} = \frac{\text{mass}}{\text{density}} = \frac{130.00 \text{ g}}{2.07 \text{ g/mL}} = 62.8 \text{ mL} \quad (3 \text{ sig. figs.})$$

4. What mass of mercury (density 13.6 g/ml) will occupy a volume of 25.00 ml?

$$\text{mass} = \text{volume} \times \text{density}$$

$$= 25.00 \text{ mL} \times 13.6 \text{ g/mL} = 340 \text{ g} \quad (3 \text{ sig. figs.})$$

5. Calculate the volume, in litres, of a box 1.5 meters long, 12 centimetres wide, and 45 millimetres deep.

$$1 \text{ L} = 1 \text{ dm}^3$$

$$1.5 \text{ m} = 15 \text{ dm}$$

$$12 \text{ cm} = 1.2 \text{ dm}$$

$$45 \text{ mm} = .45 \text{ dm}$$

$$V = L \times W \times h$$

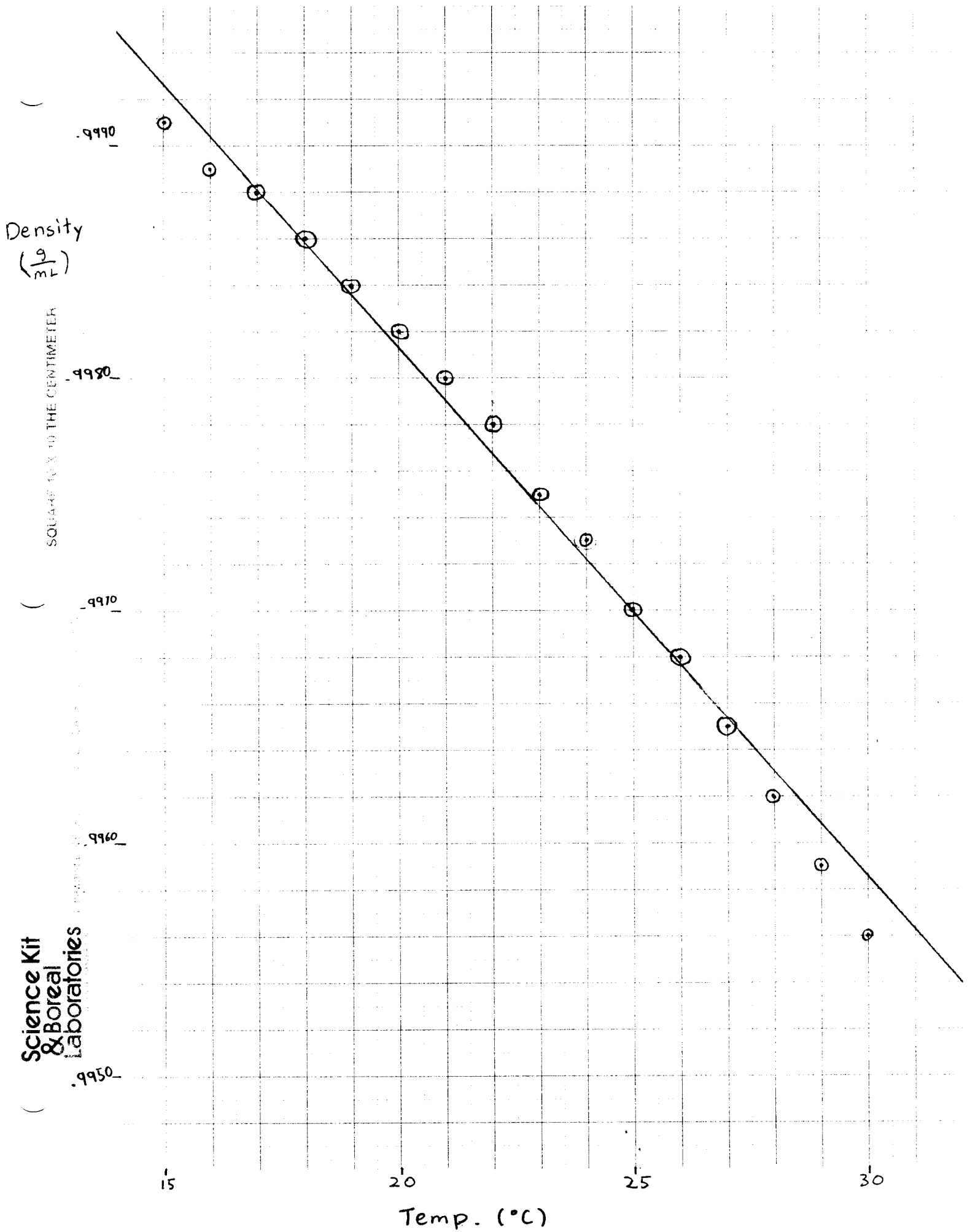
$$\text{Volume} = 15 \text{ dm} \times 1.2 \text{ dm} \times .45 \text{ dm} = 8.1 \text{ dm}^3 = 8.1 \text{ L} \quad (2 \text{ sig. figs.})$$

$$150 \text{ cm} \times 12 \text{ cm} \times 4.5 \text{ cm} = 8100 \text{ cm}^3 = 8100 \text{ mL} = \del{8.1} 8.1 \text{ L}$$

6. Calculate the density of a solid that has a mass of 260.0 g and has a volume of 50.0 ml.

$$d = \frac{m}{V} = \frac{260.0 \text{ g}}{50.0 \text{ mL}} = 5.20 \text{ g/mL} \quad (3 \text{ sig. figs.})$$

Density of Water at Various Temperatures



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