Measurement topic test 5

Name: _____ Date: _____

10 questions | 52 marks | 75 minutes

Planning and validation. Use a scientific calculator, show working and include units. Sketches are not to scale.

A scientific calculator may be used.

1. A student writes three conversions. Correct each one. [6 marks]

(a) The student writes $4\,\text{mm} = 0.4\,\text{m}$. [2 marks]

(b) The student writes $3.2\,\text{m}^2 = 320\,\text{cm}^2$. [2 marks]

(c) The student writes $0.8\,\text{m}^3 = 80\,\text{L}$. [2 marks]

2. A line on a 1:25,000 walking map is 6.4 cm long. The route takes 24 minutes. [4 marks]

(a) Find the real route length in kilometres. [2 marks]

(b) Find average speed in km/h. [2 marks]

3. A running-track outline consists of a 12 m by 6 m rectangle with one semicircle of radius 3 m attached to each 6 m end. [6 marks]

(a) Find the enclosed area to two decimal places. [3 marks]

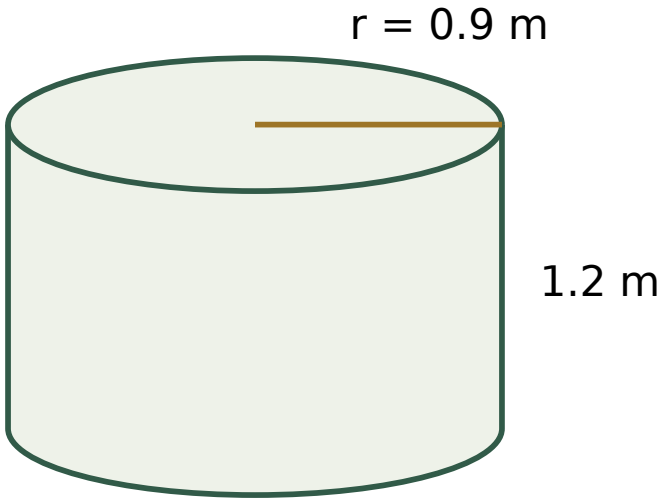
(b) Find its outside perimeter to two decimal places. [3 marks]

4. A rectangular enclosure is 15 m by 10 m. A 3 m gate leaves one continuous open fence line. Posts must be at both ends of that line and no more than 2 m apart. [5 marks]

(a) Find the fence-line length. [2 marks]

(b) Find the minimum number of posts for this line, ignoring extra corner-post requirements. [3 marks]

5. An internal cylindrical tank has diameter 1.8 m and height 1.2 m. [5 marks]



Sketch not to scale

(a) Find its capacity to the nearest litre. [3 marks]

(b) Can it hold 3000 L with at least 60 L of empty capacity? Explain. [2 marks]

6. A drink has density 1.05 kg/L. A batch contains 18 L. It is packed into 750 mL bottles, each empty bottle having mass 0.3 kg. [5 marks]

(a) Find the number of completely filled bottles. [2 marks]

(b) Find the total mass of drink and bottles. [3 marks]

7. A redesign changes every length of a package to 80% of its former value. [5 marks]

(a) Find the new surface-area percentage. [2 marks]

(b) Find the percentage reduction in volume. [3 marks]

8. A vehicle uses 8 L per 100 km. It starts a 210 km trip with 20 L. A reserve of at least 3 L is required on arrival. The steady travelling speed is 90 km/h. [5 marks]

(a) Check whether the planned fuel amount meets the reserve condition. [3 marks]

(b) Find travel time with no stops. [2 marks]

9. A flooring report says: “The floor is 8 by 5, so order 40.” [5 marks]

(a) Identify two missing pieces of information needed before making a reliable order. [2 marks]

(b) If the dimensions are metres and boxes cover 2.5 m^2, find the number of boxes with 15% extra area. [3 marks]

10. A 120 m^2 surface needs two coats. Paint A costs AUD 55 per 5 L tin and covers 10 m^2/L. Paint B costs AUD 100 per 10 L tin and covers 8 m^2/L. Assume both are otherwise suitable. [6 marks]

(a) Find each whole-tin order. [3 marks]

(b) Recommend the cheaper order, calculate the saving and state a model limitation. [3 marks]