Answer **all** the questions in the spaces provided.

For Examiner's Use

1 The volume of fuel in the tank of a car is monitored using a meter as illustrated in Fig. 1.1.

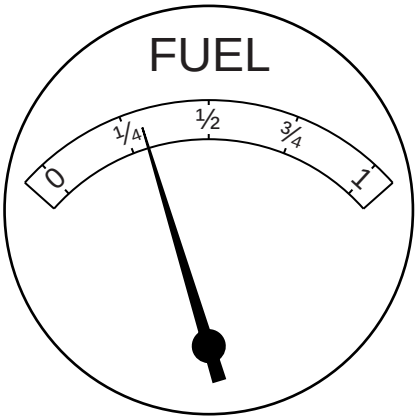

Fig. 1.1

The meter has an analogue scale. The meter reading for different volumes of fuel in the tank is shown in Fig. 1.2.

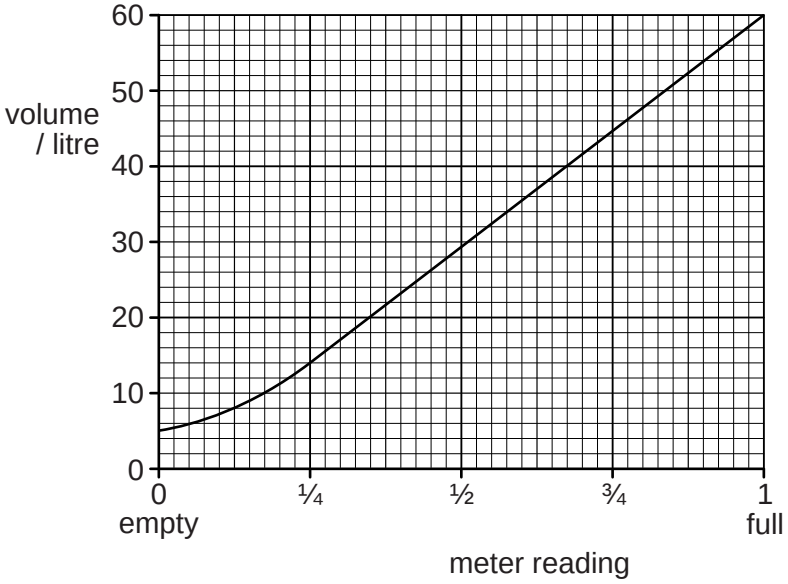

Fig. 1.2

The meter is calibrated in terms of the fraction of the tank that remains filled with fuel.

For Examiner's Use

(a) The car uses 1.0 litre of fuel when travelling 14 km. The car starts a journey with a full tank of fuel.

(i) Calculate the volume of fuel remaining in the tank after a journey of 210 km.

volume = ... litres [2]

(ii) Use your answer to **(i)** and Fig. 1.2 to determine the change in the meter reading during the 210 km journey.

from *full* to ..... [1]

(b) There is a systematic error in the meter.

(i) State the feature of Fig. 1.2 that indicates that there is a systematic error.

.....

..... [1]

(ii) Suggest why, for this meter, it is an advantage to have this systematic error.

.....

..... [1]

[Turn over