# 1.1 using standard form

**1a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

29 × 98 × 186       ***(M1)***

**Note:** Award ***(M1)*** for correct substitution into volume of a cuboid formula.

530 000 (mm)       ***(A1) (C2)***

**Note:** Answer must be written to 2 sf for the final ***(A1)*** to be awarded.

***[2 marks]***

**1b.** *[2 marks]*

## Markscheme

5.3 × 10       ***(A1)*(ft)*(A1)*(ft)*(C2)***

**Note:** Follow through from part (a).   
Award ***(A0)(A0)*** for answers of the type 53 × 10.

***[2 marks]***

**1c.** *[2 marks]*

## Markscheme

evidence of 10 mm = 1 cm     ***(A1)***

**Note:** Award ***(A1)*** for dividing their volume from part (a) or part (b) by 1000.

529 (cm)  (528.612 (cm))    ***(A1)*(ft) *(C2)***

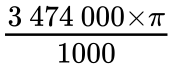
**Note:** Follow through from parts (a) or (b). Accept answers written in scientific notation.

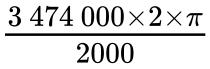
***[2 marks]***

**2a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

      ***(M1)(M1)***

**Note:** Award ***(M1)*** for correct numerator and ***(M1)*** for dividing by 1000 **OR** equivalent, such as  ie diameter.  
Do not accept use of area formula ie .

10 913.89287… (km)      ***(A1)  (C3)***

***[3 marks]***

**2b.** *[1 mark]*

## Markscheme

10 900 (km)      ***(A1)*(ft)  *(C1)***

**Note:** Follow through from part (a).

***[1 mark]***

**2c.** *[2 marks]*

## Markscheme

1.09 × 10      ***(A1)*(ft)*(A1)*(ft)*(C2)***

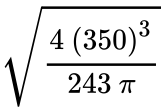
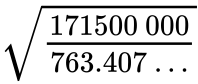
**Note:** Follow through from part (b) only. Award ***(A1)*(ft)** for 1.09, and ***(A1)*(ft)** × 10. Award ***(A0)(A0)*** for answers of the type: 10.9 × 10.

***[2 marks]***

**3a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

  ***OR***     ***(M1)***

**Note:** Award **(M1)** for substitution of 350 into volume formula.

= 473.973…    ***(A1)***

= 474 (cm)    ***(A1)*(ft)   *(C3)***

**Note:** The final **(A1)(ft)** is awarded for rounding **their** answer to 1 decimal place provided the unrounded answer is seen.

***[3 marks]***

**3b.** *[1 mark]*

## Markscheme

474 (cm)      ***(A1)*(ft) *(C1)***

**Note:** Follow through from part (a).

***[1 mark]***

**3c.** *[2 marks]*

## Markscheme

4.74 × 10 (cm)     ***(A1)*(ft)*(A1)*(ft)*(C2)***

**Note:** Follow through from **part (b) only**.

Award ***(A0)(A0)*** for answers of the type 0.474 × 10.

***[2 marks]***

**4a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

24500 × 25   ***(M1)***

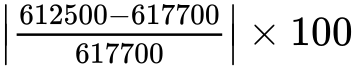
**Note:** Award ***(M1)*** for multiplying 24500 by 25.

= 613000  (612500)   ***(A1) (C2)***

***[2 marks]***

**4b.** *[2 marks]*

## Markscheme

    ***(M1)***

**Note:** Award ***(M1)*** for correct substitution into the percentage error formula.

= 0.842  (0.841832)    **(A1)*(ft)* (C2)**

**Note:** Follow through from part (a).

***[2 marks]***

**4c.** *[2 marks]*

## Markscheme

8.42 × 10    ***(A1)*(ft)*(A1)*(ft) *(C2)***

**Note:** Award ***(A0)(A0)*** for answers of the type 84.2 × 10. Follow through from part (b). Ignore ‘%’ sign.

***[2 marks]***

**5a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

4.8 × 10 × 2.5     ***(M1)***

**Note:** Award ***(M1)*** for multiplying by 2.5.

1.2 × 10 (cm)     (***A1)*(ft)*(A1)*(ft) *(C3)***

**Note:** Award ***(A0)(A0)*** for answers of the type 12 × 10.

***[3 marks]***

**5b.** *[1 mark]*

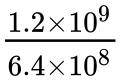
## Markscheme

640 000 000 (cm)  (6.4 × 10 (cm))     ***(A1)***

***[1 mark]***

**5c.** *[2 marks]*

## Markscheme

     ***(M1)***

**Note:** Award ***(M1)*** for division by 640 000 000.

= 1.88 (1.875)     ***(A1)*(ft) *(C3)***

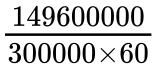
**Note:** Follow through from part (a) and part (b)(i).

***[2 marks]***

**6a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

     ***(M1)(M1)***

**Note:** Award ***(M1)*** for dividing the **correct** numerator (which can be presented in a different form such as  or ) by  and ***(M1)*** for dividing by 60.

     ***(A1)     (C3)***

***[3 marks]***

**6b.** *[3 marks]*

## Markscheme

     ***(M1)***

**Note:** Award ***(M1)*** for multiplying 323 by , seen with **any** power of 10; therefore only penalizing incorrect power of 10 once.

     ***(A1)(A1)     (C3)***

**Note:** Award ***(A1)*** for 3.06.

Award ***(A1)*** for 

Award ***(A0)(A0)*** for answers of the type: 

***[3 marks]***

**7a.** *[2 marks]*

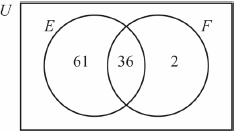
## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

     ***(M1)***

**Note:**     Award ***(M1)*** for subtracting 36 from 97.

**OR**



***(M1)***

**Note:** Award ***(M1)*** for 61 **and** 36 seen in the correct places in the Venn diagram.

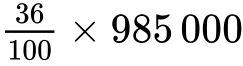
     ***(A1)***     ***(C2)***

**Note:**     Accept 61.0 (%).

***[2 marks]***

**7b.** *[2 marks]*

## Markscheme

     ***(M1)***

**Note:**     Award ***(M1)*** for multiplying 0.36 (or equivalent) by .

     ***(A1)***     ***(C2)***

***[2 marks]***

**7c.** *[2 marks]*

## Markscheme

     ***(A1)*(ft)*(A1)*(ft)*****(C2)***

**Note:**     Award ***(A1)(ft)*** for 3.55 (3.546) **must** match part (b), and ***(A1)(ft)*** .

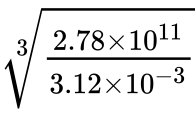
Award ***(A0)(A0)*** for answers of the type: . Follow through from part (b).

***[2 marks]***

**8a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

**OR**     ***(M1)***

**Note:**     Award ***(M1)*** for correct substitution into given expression.

44664.59503     ***(A1)***     ***(C2)***

**Note:**     Award ***(A1)*** for a correct answer with at least 8 digits.

Accept 44664.5950301.

***[2 marks]***

**8b.** *[1 mark]*

## Markscheme

44664.60     ***(A1)*(ft)*****(C1)***

**Note:**     For a follow through mark, the answer to part (a) must be to at least 3 decimal places.

***[1 mark]***

**8c.** *[1 mark]*

## Markscheme

44700     ***(A1)*(ft)*****(C1)***

**Notes:**     Answer to part (a) must be to at least 4 significant figures.

Accept any equivalent notation which is correct to 3 significant figures.

For example  or .

Follow through from part (a).

***[1 mark]***

**8d.** *[2 marks]*

## Markscheme

     ***(A1)*(ft)*(A1)*(ft)**     ***(C2)***

**Notes:**     Award ***(A1)*(ft)** for 4.47 and ***(A1)*(ft)** for .

Award ***(A0)(A0)*** for answers such as .

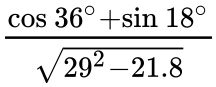
Follow through from part (b)(ii) **only**.

***[2 marks]***

**9a.** *[2 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

    ***(M1)***

**Note:** Award ***(M1)*** for correct substitution into formula.

    ***(A1)     (C2)***

**Note:** Accept .

***[2 marks]***

**9b.** *[2 marks]*

## Markscheme

(i)     0.04     ***(A1)*(ft)**

(ii)     0.0391     ***(A1)*(ft)     *(C2)***

**Note:** Follow through from part (a).

***[2 marks]***

**9c.** *[2 marks]*

## Markscheme

    ***(A1)*(ft)*(A1)*(ft)     *(C2)***

**Note:** Answer should be consistent with their answer to part (b)(ii). Award ***(A1)*(ft)** for 3.91, and ***(A1)*(ft)** for . Follow through from part (b)(ii).

***[2 marks]***

**10a.** *[4 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

i)            ***(M1)***

**Note:** Award ***(M1)*** for correct substitution into the surface area of a sphere formula.

       ***(A1)    (C2)***

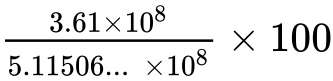
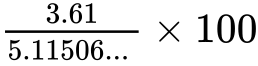
**Note:** Award at most ***(M1)(A0)*** for use of  for , which will give an answer of .

ii)           ***(A1)*(ft)*(A1)*(ft) *(C2)***

**Note:** Award ***(A1)*** for  and ***(A1)*** for .  
Award ***(A0)(A0)*** for answers of the type: .  
Follow through from part (a)(i).

**10b.** *[2 marks]*

## Markscheme

  **OR**   **OR**         ***(M1)***

**Note:** Award ***(M1)*** for correct substitution. Multiplication by  must be seen.

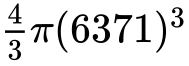
        ***(A1)*(ft) *(C2)***

**Note:** Follow through from part (a). Accept the use of  sf answers, which gives a final answer of  .

**11a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

     ***(M1)***

**Note:** Award ***(M1)*** for correct substitution into volume formula.

     ***(A2)     (C3)***

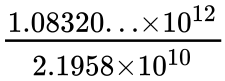
**Notes:** Award ***(A1)(A0)*** for correct mantissa between 1 and 10, with incorrect index.

Award ***(A1)(A0)*** for 

Award ***(A0)(A0)*** for answers of the type: .

**11b.** *[3 marks]*

## Markscheme

     ***(M1)***

**Note:** Award ***(M1)*** for dividing their answer to part (a) by .

     ***(A1)*(ft)**

**Note:**Accept  from use of 3 sf answer to part (a).

     ***(A1)     (C3)***

**Notes:** Follow through from part (a).

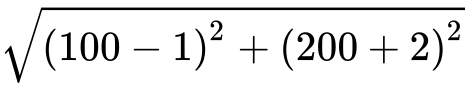
The final ***(A1)*** is awarded for their unrounded non-integer answer seen and given correct to the nearest integer.

Do not award the final ***(A1)*** for a rounded answer of 0 or if it is incorrect by a large order of magnitude.

**12a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

     ***(M1)***

     ***(A1)***

**Note:** Award ***(M1)(A1)*** if  seen.

     ***(A1)     (C3)***

**Note:** Award ***(A1)*** for their answer given correct to 2 decimal places.

**12b.** *[1 mark]*

## Markscheme

     ***(A1)*(ft)     *(C1)***

**Note:** Follow through from their part (a).

**12c.** *[2 marks]*

## Markscheme

     ***(A1)*(ft)*(A1)*(ft)     *(C2)***

**Notes:** Award ***(A1)(A0)*** for  and an incorrect index value.

Award ***(A0)(A0)*** for answers such as .

**13.** *[2 marks]*

## Markscheme

     ***(A1)*(ft)*(A1)*(ft)     *(C2)***

**Notes:** Award ***(A1)*(ft)** for their  , ***(A1)*(ft)** for .

Follow through from part (a).

**14.** *[4 marks]*

## Markscheme

(i)     0.02     ***(A1)*(ft)**

(ii)     0.01563     ***(A1)*(ft)**

**Notes:**     For parts (i) and (ii), accept equivalent standard form representations.

(iii)          ***(A2)*(ft)     *(C4)***

**Notes:**     Award ***(A1)(A0)*** for correct mantissa, between 1 and 10, with incorrect index.

     Follow through from their answer to part (a).

     Where the candidate has correctly rounded their mantissa from part (a) and has the correct exponent, award ***(A0)(A1)***

     Award ***(A0)(A0)*** for answers of the type: .

***[4 marks]***

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