1.13 Standard Form: 10-minute Pack

Calculators not allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A chemical container holds 4.8×10^2 cm³ of liquid. Another holds 1.2×10^{-1} cm³. What is the total volume in standard form?

(3)

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2 A physics exam question: The charge on an electron is about 1.6×10^{-19} coulombs. How many electrons are needed to make a charge of 3.2×10^{-16} C? Give your answer in standard form, to 2 significant figures.

(3)

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3 State whether each of these numbers is greater than, equal to, or less than 1 in standard form. Give an explanation for each.

(a) 5.0×10^{-1} **(1)**

(b) 9.1×10^{0} **(1)**

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Mark scheme · 1.13 Standard Form: 10-minute Pack

Question 1

convert to same power or adjust: $4.8 \times 10^2 = 480$, $1.2 \times 10^{-1} = 0.12$ then add to get 480.12	**M1**
express 480.12 in standard form: 4.8012×10^2 or round if required	**M1**
4.8012×10^2 cao	**A1**

Answer: **4.8012×10^2 cm^3**

Question 2

divide total charge by charge per electron: $3.2 \times 10^{-16} / 1.6 \times 10^{-19}$	**M1**
compute $3.2/1.6 = 2$ and subtract powers: $10^{-16 - (-19)} = 10^3$ giving 2×10^3	**M1**
2.0×10^3 cao to 2 s.f	**A1**

Answer: **2.0×10^3**

Question 3

(a) less than 1 with reason: coefficient $5.0 \times 10^{-1} = 0.5 < 1$	**B1**

(a) Answer: **Less than 1 because $5.0 \times 10^{-1} = 0.5$**

(b) greater than 1 with reason: $9.1 \times 10^0 = 9.1 > 1$	**B1**

(b) Answer: **Greater than 1 because $9.1 \times 10^0 = 9.1$**

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