

Mark schemes

Q1.

(a) 1.25×10^4

accept $10^4 \times 1.25$

B1

Additional Guidance

1.2×10^4 or 1.3×10^4

B0

(b) 0.034

accept $\frac{34}{1000}$ (oe fraction)

B1

Additional Guidance

If fraction given, ignore attempts to cancel

[2]

Q2.

(a) 0.0048

B1

(b) 0.000 012

B1

(c) 2.5×10^6

B1

[3]

Q3.

(a) 2.4×10^8

B1

(b) 36×10^{11} or 3 600 000 000 000
or 0.004 (×) 900 000 000 000 000

M1

3.6×10^{12}

A1

[3]

Q4.

(a) 1

B1

(b) $\frac{1}{5^3}$ or $\frac{1}{125}$ or $0.2 \times 0.2 \times 0.2$

$$\left(\frac{1}{5}\right)^3 \text{ or } 125^{-1} \text{ or } 0.2^3$$

M1

$$0.008 \text{ or } \frac{8}{1000}$$

A1

$$8 \times 10^{-3}$$

ft Any decimal $0 < x < 1$ correctly converted to standard form

A1 ft

[4]

Q5.

(a) 5.83×10^{-4}

B1

(b) 941 600

Additional Guidance

Accept 941,600 or 941 600.0(...)

B1

(c) $7\,200\,000\,000 \div 300$
or $7200 \times 10^6 \div 300$
or $7.2 \times 10^9 \div 300$
or 24 million

oe

M1

24 000 000
or 24×10^6
or 0.024×10^9

oe

A1

$$2.4 \times 10^7$$

ft M1 and their 24 000 000 written in standard form

A1ft

[5]

Q6.

(a) 1.8×10^4

B1 18×10^3 or 18 000 seen

B1 for $\frac{1800000}{100}$ oe

B1 for $300\,000 \times 0.06$

B2

Additional Guidance

18,000

	<i>Standard notation</i>		
	18.000		B1
	<i>Continental notation</i>		
	1 800 000 × 0.01		B1
			B1
(b)	5×10^3		
	<i>B1 0.5×10^4 or 5 000 seen</i>		
	<i>B1 for 120 000 seen</i>		
			B2
	Additional Guidance		
	5,000		
	<i>Standard notation</i>		
	5.000		B1
	<i>Continental notation</i>		
			B1
			[4]
Q7.			
	9×10^3		
			B1
			[1]
Q8.			
	$6.005\ 2(00) \times 10^6$		
	<i>B1 for their 6 005 200 written normally and correctly converted to standard form</i>		
	<i>or no number written normally and answer $6.(...) \times 10^6$</i>		
			B2
	Additional Guidance		
	(6 500 200 and) $6.500\ 2(00) \times 10^6$		
			B1
	65 200 and 6.52×10^4		
			B1
	$10^6 \times 6.005\ 2(00)$		
			B2
	Correct value of 6 005 200 with no conversion to standard form		
			B0
	6×10^6 with no number written normally		
			B1
			[2]
Q9.			

61.6×10^3

B1

[1]

Q10.

9.56×3^{10} 9563 9.56×10^3
or 564 508 (.44) 9563 9560
with no incorrect evaluations seen

B1 9.563×10^3

or 9560

or 564 508 (.44) or $5.6(450844) \times 10^5$

SC1 9.56×10^3 9563 9.56×3^{10} with no incorrect evaluations seen

B2

Additional Guidance

Allow numbers to be written in original or converted form or as a mixture for B2 or SC1

Incorrect evaluation seen scores a maximum of B1

[2]

Q11.

(a) $(2.318 \times 10^3) \div (3.8 \times 10^6)$

M1

6.1

A1

-4

A1

(b) $A \times 10^7$

where $2.0 < A < 3.0$

B1 $A \times 10^6$

where $20 < A < 30$

SC1 $A \times 10^6$ or $A \times 10^8$

where $2.0 < A < 3.0$

B2

[5]

Q12.

(a) 9.82×10^2 9.81×10^3 9812

B1

(b) Any different example correctly evaluated

eg $2 \times 10^3 \times 4 \times 10^2 = 8 \times 10^5$

M1

Not correct and correct reason

or
Not correct and counter example

eg

Not correct

and

$$4 \times 10^6 \times 3 \times 10^7 = (4 \times 3) \times 10^{(6+7)} \\ = 12 \times 10^{13}$$

Not correct and $a \times c$ might be 10 or greater

A1

[3]

Q13.

5 850 000 or 130 or 45 000
or 4.5 or 10^4

M1

$$4.5 \times 10^4$$

A1

[2]

Q14.

$$5 \times 10^{-4}$$

B1

[1]

Q15.

- (a) Explanation that in $A \times 10^b$ the value of A must be range $1 \leq A < 10$

eg the first part should be 1.01376

Accept the correct conversion to

$$1.01376 \times 10^5$$

B1

Additional Guidance

Ignore errors in inequalities given as a range for the acceptable first part of a number in standard form if the written answer shows clear understanding

eg in $a \times b^n$, a must be less than 10, $0 < a < 10$

B1

- (b) Explanation that the power should be positive

eg the power should be 5, not -5

this gives 0.0000101376 (or $\frac{99}{9765625}$)

Accept the correct conversion to

$$1.01376 \times 10^5 \text{ unless awarded in 12(a)}$$

B1

Additional Guidance

Allow an incorrect conversion with a correct statement
eg the power should be positive, -5 gives 0.00000101376

B1
[2]

Q16.

$$0.99 \times 10^{-2}$$

B1
[1]

Q17.

(a) Malta

B1

(b) 16770000 or 16800000 or 1.68×10^7 seen

M1

Netherlands

A1
[3]