Mark schemes

Q1.

(a) 16

B1

(b) 125

B1

(c) 14

B1

[3]

Q2.

27

B1

81

ft their 27 × 3
Answers must be evaluated

B1ft

[2]

Q3.

4

B1

Additional Guidance

$(\sqrt{4})^2$ = 4 is incorrect method

[1]

Q4.

3^8

B1

[1]

Q5.

10

B1

[1]

Q6.

32

B1

[1]

Q7.

8

B1

[1]

Q8.

5^{11}

B1

[1]

Q9.

Lists three from 3, 9, 27, 81, 243, 729
or lists three from 1, 4, 9, 16, …, 225, 256, 289
or correctly evaluating a power of 3 + a square number

eg 27 + 25 = 52 or $3^3 + 5^2 = 52$

or correctly evaluating 268 – a power of 3

eg 268 – 27 = 241

or correctly evaluating 268 – a square number

eg 268 – 49 = 219

M1

$243 + 25$ or $3^5 + 5^2$

oe

Addition sign must be seen in working or on answer line

A1

Additional Guidance

3^5, 5^2 or 3^5 and 5^2 on answer line

M1A0

$268 – 243 = 25$

M1A0

243, 25 or 243 and 25 on answer line

M1A0

Beware of $5^3 + 5^2$

[2]

Q10.

Alternative method 1 of 4

Identifies any 3-digit cube number

125 or 216 or 343 or 512 or 729

M1

125 and 216 and 343 and 512 and 729

M1dep

125 and 216 and 343 and 512 and 729
and 64 and 1000

A1

Alternative method 2 of 4

Identifies any 3-digit cube number

125 or 216 or 343 or 512 or 729

M1

$5^3 = 125$ and $9^3 = 729$ and 5, 6, 7, 8, 9 or 9 – 4 = 5

M1dep

$5^3 = 125$ and $9^3 = 729$ and 5, 6, 7, 8, 9 or 9 – 4 = 5 and (4^3 =) 64 and (10^3 =) 1000

A1

Alternative method 3 of 4

$\sqrt[3]{100} = 4.6...$

M1

$\sqrt[3]{999} = 9.9...$ or $\sqrt[3]{1000} = 10$

M1

$\sqrt[3]{100} = 4.6...$

and $\sqrt[3]{999} = 9.9...$ or $\sqrt[3]{1000} = 10$
and 5, 6, 7, 8, 9 or 9 – 4 = 5

A1

Alternative method 4 of 4

$5^3 = 125$

M1

$10^3 = 1000$ or $\sqrt[3]{1000} = 10$

M1

$4^3 = 64$ and $5^3 = 125$
and $10^3 = 1000$ or $\sqrt[3]{1000} = 10$
and 5, 6, 7, 8, 9 or 9 – 4 = 5

A1

[3]

Q11.

(a) 343

B1

(b) Any two cube numbers from 8 or 27 or 64 or 125 or 216

M1

125 and 216

Any order
Accept 5^3 and 6^3
Accept 5 and 6

A1

[3]

Q12.

3^4

Any unambiguous indication

B1

[1]

Q13.

10 000

B1

[1]

Q14.

(a) 24

B1

(b) 7.5(26…)

B1

(c) 6.25 or $6\frac{1}{4}$ or $\frac{25}{4}$

B1

[3]

Q15.

(a) 16

B1

(b) 5^{11}

B1

[2]

Q16.

27

B1

[1]