

M1.

$$3x - (x - 5)$$

*Condone omission of brackets***M1**

$$2x + 5 = 17$$

M1

6

*SC2 11***A1****Alternative 1**

$$2^{3x} = 2^{17} \times 2^{x-5}$$

M1

$$3x = 12 + x$$

M1

6

*SC2 11***A1****Alternative 2**Substitutes a value for x and evaluates correctly as a power of 2.**M1**Substitutes a different value for x and evaluates correctly as a power of 2 which is closer to 17.**M1**

6

*SC2 11***A1****[3]****M2.**

$$x^{-\frac{2}{3}} \text{ or } a = -\frac{2}{3}$$

$$B2 \quad (x^{\frac{-1}{3}})^2 \text{ or } (x^2)^{\frac{-1}{3}} \text{ or } (x^{\frac{2}{3}})^{-1} \text{ or}$$

$$(x^{-2})^{\frac{1}{3}} \text{ or } (x^{\frac{1}{3}})^{-2} \text{ or } \frac{1}{x^{\frac{2}{3}}} \text{ or } -\frac{2}{3}$$

$$B1 \quad (\sqrt[3]{x})^2 \text{ or } (\sqrt[3]{x^2})^{-1} \text{ or } \left(\frac{1}{x^2}\right)^{\frac{1}{3}}$$

$$\text{or } \frac{1}{(x^2)^{\frac{1}{3}}} \text{ or } \left(\frac{1}{\sqrt[3]{x}}\right)^2$$

or base x with any negative index.

B3

[3]

M3. Correct evaluation of a relevant power of 2 or 16

$$\text{eg } 16^{\frac{1}{2}} = (\pm) 4 \text{ or } 16^{\frac{1}{4}} = 2 \text{ or } 2^4 = 16 \text{ or } 16^2 = 256$$

or $4^c = d$

$$16^{\frac{1}{4}} = (\pm) 2 \text{ or } 16^1 = 16 \text{ or } 16^0 = 1$$

M1

One correct pair of answers

A correct answer is such that $d = 4c$

A1

A second correct pair of answers

$$\text{eg } c = 0, d = 0$$

$$c = 1, d = 4 \text{ or } c = -1, d = -4$$

$$c = 2, d = 8 \text{ or } c = \frac{1}{8}, d = \frac{1}{2} \text{ etc ...}$$

A1

[3]

M4. Sequence continued correctly

horizontally for at least two terms

128 and 256 (and 512)

M1

A calculation that leads to x if evaluated correctly

or extending the sequence to at least row 3

$$2^{24} \text{ or } 4^{12}$$

$$16 \times 32^4$$

$$64^4$$

M1dep

16 777 216

A1

their value in standard form

or their value to 3 s.f.

$$1.67(77216) \times 10^7$$

$$\text{or } 1.6 \times 10^7$$

$$\text{or } 1.7 \times 10^7$$

$$\text{or } 16\,800\,000$$

For standard form allow rounding or truncation

B1ft

1.68×10^7

B1ft

[5]

M5. Correct cubing of any integer [25, 30]

$$\text{Note: } 25^3 = 15\,625$$

$$26^3 = 17\,576$$

$$27^3 = 19\,683$$

$$28^3 = 21\,952$$

$$29^3 = 24\,389$$

$$30^3 = 27\,000$$

M1

26 or 27

SC1 for 18 or $18^3 (= 5832)$

A1

[2]