# Extended Mathematics
## Topic : Number
## Year :May 2013 -May 2023
## Paper - 2
## Answers

Question 1

| | | |
|---|---|---|
| £ or pound[s] <br> **Correct working must be shown** | 2 | **M1** for $425 \div 1.14$ or $365 \times 1.14$ |

Question 2

| | | |
|---|---|---|
| $\dfrac{30}{300}$ oe www | 2 | **M1** for 30 seen or $\dfrac{k}{300}$ seen |

Question 3

| | | |
|---|---|---|
| (a) | $[\pm]$ **2.28** or 2.282 to 2.2822 | 1 |
| (b) | **0.109** or 0.1094[3…] | 1 |

Question 4

| | | |
|---|---|---|
| $\left(\dfrac{2}{3}\right)^{1.5}$  $\left(-\dfrac{2}{3}\right)^{\frac{2}{3}}$  $(1.5)^{\frac{2}{3}}$  $\left(\dfrac{2}{3}\right)^{-1.5}$ | 2 | **M1** for at least 2 correct decimals seen <br> 1.3[1..]  0.5[4..]  1.8[3..] or 1.84  0.7[6..] |

Question 5

| | | |
|---|---|---|
| (a) | $1.1 \times 10^5$ | 2 |
| (b) | $5 \times 10^3$ | 2 |

Question 6

| | | |
|---|---|---|
| $17 - 4n$ | 2 | **B1** for $\pm 4n$ seen |

Question 7

| | | |
|---|---|---|
| $4.55 \times 10^8$ | 2 | **B1** for figs 455 seen |

Question 8

| | | |
|---|---|---|
| 2.2[0...] | 2 | **M1** for $11.99 \div 0.626$ soi by 19.2 or 19.15... |

**Question 9**

| | | | |
|---|---|---|---|
| **(a)** | 5.17225... | 1 | |
| **(b)** | 5.2 | 1FT | **FT** *their* (a) |

**Question 10**

| | | |
|---|---|---|
| 6.1 final answer | 2 | **M1** for [√37.8225=] 6.15 |

**Question 11**

| | | |
|---|---|---|
| with 2 correct steps seen $\dfrac{18k}{35k}$ | 3 | **B1** for $\dfrac{5k}{3k}$ and **M1** for $\dfrac{6}{7} \times$ *their* $\dfrac{3}{5}$ |

**Question 12**

| | | |
|---|---|---|
| 6632.55 cao final answer | 3 | **M2** for $6250 \times (1 + \frac{2}{100})^3$ oe or **M1** for $6250 \times (1 + \frac{2}{100})^2$ oe **SC2** for answer 382.55 final answer |

**Question 13**

| | | |
|---|---|---|
| 15 | 4 | **M2** for $\dfrac{1}{2} \times 40 \times (26 + 19)$ oe or **M1** for one valid area calculation **Indep M1** for ÷ 60 **SC3** for answer 900 |

**Question 14**

| | |
|---|---|
| 11 or −11 | 1 |

**Question 15**

| | | |
|---|---|---|
| **(a)** | 1.32656... | 1 |
| **(b)** | 1.327 | 1ft |

**Question 16**

| | | |
|---|---|---|
| 72 | 2 | **M1** for 84 ÷ 7 |

**Question 17**

correct working;

e.g. $\dfrac{3k}{2k} \times \dfrac{16n}{3n} = 8$

| 2 | **M1** for $\dfrac{3k}{2k}$ <br><br> and **A1** for $\dfrac{3k}{2k} \times \dfrac{16n}{3n} = 8$ |

**Question 18**

48.15, 48.45 cao

| 2 | **B1 B1** <br> If 0 then **M1** for 16.0 and 16.15 soi |

**Question 19**

175 cao final answer

| 3 | **B2** for 175.4 ... <br> or **M1** for $200 \div 1.14$ |

**Question 20**

454.27 cao final answer

| 3 | **M1** for $420 \times (1 + \frac{4}{100})^2$ oe <br> and <br> **A1** for 454 or 454.2 to 454.3 <br> or **SC2** for answer 34.27 <br> or **SC1** for answer 34.2 to 34.3 |

**Question 21**

**(a)**   2.8 oe

| 1 | |

**(b)**   700

| 3 | **M2** for ½(20 + 30) × 28 oe <br> or **M1** for a correct area statement |

**Question 22**

39

| 2 | **M1** for 52 × 45 ÷ 60 oe |

**Question 23**

tan 100, cos 100, 1/100, $100^{-0.1}$

| 2 | **B1** for decimals –0.1[[7..], –5.[67..], [0.01], <br> 0.6[3..] or for three in the correct order |

**Question 24**

**(a)**  600 000

| 1 | |

**(b)**  79.2

| 2 | **M1** for 22 × 60 × 60 ÷ 1000 oe |

**Question 25**

| | | |
|---|---|---|
| 25[.00] | 3 | **M2** for $30 \times \dfrac{100}{120}$ oe <br><br> or **M1** for 30 associated with 120% <br> e.g. $1.2x = 30$ |

**Question 26**

| | | |
|---|---|---|
| **(a)** $7.5 \times 10^{-2}$ | 2 | **M1** for 0.075 or $\dfrac{3}{40}$ or $\dfrac{6}{80}$ or $0.75 \times 10^{-1}$ oe |
| **(b)** $9.3 \times 10^{7}$ | 2 | **M1** for 93 000 000 or $93 \times 10^{6}$ or $0.93 \times 10^{8}$ oe |

**Question 27**

| | | |
|---|---|---|
| 19%  $0.719^5$  $\sqrt{0.038}$  sin 11.4  1/5 | 2 | **B1** for decimals [0.19], [0.2], 0.194…, 0.197…, 0.192… seen <br><br> Or for four in correct order |

**Question 28**

| | | |
|---|---|---|
| **(a)** –447 | 1 | |
| **(b)** 2 | 1 | |

**Question 29**

| | | |
|---|---|---|
| 10.1[0] | 3 | **M1** for 1.3199 and 1.3401 seen <br> and **M1** for $500 \times 1.3199$ or $500 \times 1.3401$ <br> or for $500 \times$ (*their* highest – *their* lowest) oe |

**Question 30**

| | | |
|---|---|---|
| 10[.00] | 3 | **M2** for 1.90 and 2.90 and 5.20 only <br> or **M1** for two of 1.90, 2.90, 5.20 in a list of three or two values from the table <br><br> or **SC1** FOR 1.90, 2.90, 4.30 $\left[ \text{from } \dfrac{3.40 + 5.20}{2} \right]$ |

**Question 31**

| | | |
|---|---|---|
| 86.7 or 86.74 to 86.75 | 1 | |

**Question 32**

| | | |
|---|---|---|
| 5.293 cao | 2 | **B1** for 5.29 or 5.292 to 5.2927 |

**Question 33**

| | | |
|---|---|---|
| 7.7 | 2 | **M1** for $44 \times \dfrac{17.5}{100}$ oe |

**Question 34**

| | | |
|---|---|---|
| 435, 445 cao | 2 | **B1** for one value in the correct place<br>or **SC1** for both values correct but reversed |

**Question 35**

| | | |
|---|---|---|
| 134 | 3 | **M2** for $\dfrac{20.1 \times 100}{3 \times 5}$ oe<br><br>or **M1** for $\dfrac{x \times 3 \times 5}{100} = 20.1$<br>or $3\% = 4.02$ oe<br><br>If 0 scored **SC1** for answer of figs 134 |

**Question 36**

| | | |
|---|---|---|
| (a) $\dfrac{n}{n+2}$ oe final answer | 1 | |
| (b) $n^2 - 1$ oe final answer | 2 | **B1** for any quadratic in final answer |

**Question 37**

| | | |
|---|---|---|
| (a) $\dfrac{9}{12} - \dfrac{1}{12}$ oe | **M1** | Must be shown |
| $[=]\dfrac{8}{12}$ oe $\quad [=]\dfrac{2}{3}$ | **M1** | Both fractions must be shown |
| (b) $\dfrac{5}{2} \times \dfrac{4}{25}$ oe | **M1** | Must be shown |
| Cancelling shown or $\dfrac{20}{50}$ oe $[=]\dfrac{2}{5}$ | **M1** | **Dependent** and cancelling shown or a fraction and then $\dfrac{2}{5}$ must be shown |

**Question 38**

| | | |
|---|---|---|
| (a) 40 | 2 | **M1** for $\dfrac{144 \times 1000}{60 \times 60}$ oe |
| (b) 3.5 | 2FT | FT 140 ÷ *their* **(a)**<br>**M1** for dist ÷ *their* **(a)**<br>or dist ÷ 40<br>or dist $\times \dfrac{60 \times 60}{144 \times 1000}$<br>or **B1** for 140 seen |

**Question 39**

$-16$ | **1** |

**Question 40**

1030 | **2** | **M1** for $1350 \div 1.313$

**Question 41**

0.059161... | **1** |

$5.9161... \times 10^{-2}$ | **1FT** | ft *their* part (a)

**Question 42**

$\dfrac{5}{4}$ oe | **B1** | Do not allow decimals for the **B1**, **M1**, or **A1**

$\dfrac{5 \times 9}{4 \times 9}$ and $\dfrac{7 \times 4}{9 \times 4}$ oe or better | **M1** **FT** | e.g. $\dfrac{45}{36}$ and $\dfrac{28}{36}$

$\dfrac{17}{36}$ **oe working must be shown** | **A1** | Follow through *their* $\dfrac{5}{4}$ for the **M1** mark.

Alt method 1: **B1** for $\dfrac{1}{4} + \dfrac{2}{9}$

**M1** for $\dfrac{1 \times 9}{4 \times 9}$ and $\dfrac{2 \times 4}{4 \times 9}$ oe e.g. $\dfrac{9}{36}$ and $\dfrac{8}{36}$

Alt method 2: **B1** for $\dfrac{1}{4} - \dfrac{7}{9} + 1$

**M1** for oe e.g. $\dfrac{9}{36}$ and $\dfrac{8}{36}$

ISW converting fraction answer to a decimal.

**Question 43**

427.8 | **3** | **M2** for $2 \times (127.35 + 86.55)$ or

427.4 |  | $2 \times (127.35 + 86.45)$

or **B1** for two of these figures: 127.35, 86.55, 127.25, 86.45 seen

If zero scored, **SC2** for upper bound 427.8 or lower bound 427.4 provided nfww

**Question 44**

| | | | |
|---|---|---|---|
| | 1.49 or 1.491… | 1 | |

**Question 45**

| | | | |
|---|---|---|---|
| **(a)** | 570 000 | 1 | |
| **(b)** | $5.69 \times 10^5$ | 1 | |

**Question 46**

| | | |
|---|---|---|
| 101.4, 102.6 | 2 | **M1** for 8.45 and 8.55 seen<br>If 0 scored, **SC1** for one correct value in correct position on answer line or for two correct reversed answers |

**Question 47**

| | | |
|---|---|---|
| $2\frac{1}{2}$ %, 0.2, $\frac{43}{201}$, $\sqrt{0.1}$ | 2 | **B1** for 0.3… , 0.21… and 0.025 seen<br>or for three in correct order |

**Question 48**

| | | |
|---|---|---|
| $\left[\frac{1}{2} \times 1\frac{1}{2} = \right]\frac{3}{4}$ oe | **B1** | |
| $\frac{5 \times 2}{6 \times 2}$ and $\frac{3 \times 3}{4 \times 3}$ oe or better | **M1FT** | |
| $\frac{1}{12}$ oe<br>**working must be shown** | **A1** | |

**Question 49**

| | | |
|---|---|---|
| 3.17 or 3.174 to 3.175 | 3 | **M2** for $\dfrac{63-61}{63} \times 100$ oe or<br>$100 - \dfrac{61}{63} \times 100$ oe<br><br>or **M1** for $\dfrac{63-61}{63}$ oe or $\dfrac{61}{63} \times 100$ |

**Question 50**

| | | | |
|---|---|---|---|
| 460 | | 3 | **M2** for $\dfrac{391 \times 100}{(100-15)}$ oe |
| | | | or **M1** for recognising 391 as $(100-15)\%$ soi |

**Question 51**

| | | | |
|---|---|---|---|
| **(a)** | $-3$ | 1 | |
| **(b)** | $39 - 7n$ oe | 2 | **M1** for $-7n\ [+k]$ |
| **(c)** | 53 | 2 | **M1** for *their* (b) $= -332$ shown provided *their*(b) is linear and their answer for (c) is a positive integer |

**Question 52**

| | | |
|---|---|---|
| 1.37 | 2 | **B1** for 0.866… or $\dfrac{\sqrt{3}}{2}$ or 0.5 or $\dfrac{1}{2}$ or **B1** for 1.366… as final answer |

**Question 53**

| | | |
|---|---|---|
| $0.5^3$  $0.5^2$  $0.5$  $\sqrt[3]{0.5}$ | 2 | **B1** for 0.25 , 0.125 and 0.793…  seen or for three in correct order |

**Question 54**

| | | |
|---|---|---|
| 1.6[0] | 3 | **M1** for $800 \times 1.5$ and **M1** for *their* $1200 \div 750$ |

**Question 55**

| | | | |
|---|---|---|---|
| **(a)** | 119 | 3 | **M2** for $18 \times 6 + 11$ oe or **B1** for 18 or 11 or 108 |
| **(b)** | [0] 1 [00] pm  cao | 1 | |

**Question 56**

| | | | |
|---|---|---|---|
| **(a)** | $2 \times 10^{10}$ | 2 | **B1** for $20 \times 10^9$ or 20 000 000 000 |
| **(b)** | $1.25 \times 10^{-1}$ | 2 | **B1** for 0.125 oe |

**Question 57**

| | | |
|---|---|---|
| 2870 | 2 | **M1** for $350 \times 8.2$ |

**Question 58**

0.34    $0.7^3$    $0.6^2$    $\sqrt{0.6}$ | 2 | **M1** for decimal conversion: 0.7 [7...] or 0.8 for $\sqrt{0.6}$ and 0.36 for $0.6^2$ and 0.343 for $0.7^3$
or **B1** for three in the correct order

**Question 59**

$2.4 \times 10^8$ | 2 | **B1** for 240 000 000 oe
or **B1** for $k \times 10^8$ or $2.4 \times 10^k$

**Question 60**

48 | 2 | **M1** for $52 \div 65$ [× 60] oe implied by 0.8

**Question 61**

13891.5[0] | 3 | **M2** for $12000 \times \left(1 + \dfrac{5}{100}\right)^3$ oe

or **M1** for $12000 \times \left(1 + \dfrac{5}{100}\right)^n$ oe $n \geqslant 2$

**Question 62**

$6 + 5 \times (10 - 8) = 16$ | 1 | One pair of brackets only

**Question 63**

20 | 1 |

**Question 64**

95.5    96.5   in correct places cao | 2 | **B1** for 95.5 or 96.5 in correct place or for answers reversed

**Question 65**

(a) | 700 | 2 | **M1** for $2800 \times 0.325$

(b) | 0.28 | 1 |

**Question 66**

$\dfrac{7}{6}$ oe | **B1** |

*their* $\dfrac{7}{6} \times \dfrac{8}{7}$ oe | **M1** | Or **M1** for $\dfrac{56}{\cancel{48}} \div \dfrac{42}{\cancel{48}}$ or equivalent division

$\dfrac{4}{3}$ or $1\dfrac{1}{3}$ cao | **A1** | with fractions with common denominator

must see working

**Question 67**

| (a) | $2 \times 3 \times 3 \times 5$ | 2 | **B1** for 2, 3, [3] and 5 identified as only prime factors<br><br>or **M1** for partial prime factorisation $6 \times 3 \times 5$ or $2 \times 9 \times 5$ or $3 \times 3 \times 10$ or $2 \times 3 \times 15$ |
| (b) | 630 | 2 | **M1** for $2 \times 3^2 \times 5 \times 7$ oe<br>or for listing multiples of 90 and 105 at least up to 630 |

**Question 68**

| [0.]08 | 4 | **M3** for $200 \times \left(1 + \dfrac{2}{100}\right)^2 - 200 - \dfrac{200 \times 2 \times 2}{100}$ oe<br><br>or **M1** for $200 \times \left(1 + \dfrac{2}{100}\right)^2$<br><br>**and M1** for $\dfrac{200 \times 2 \times 2}{100}$ [+200] |

**Question 69**

| 96 | 2 | **B1** for $96k$ or $2^5 \times 3$<br>or for listing multiples of each up to 96 |

**Question 70**

| $18 - 5n$ oe | 2 | **M1** for $5n$ or $-5n$ |

**Question 71**

| 400  350  250 | 3 | **M1** for $\dfrac{1000}{8 + 7 + 5}$ implied by 50<br>**A1** for one clearly assigned correct answer<br><br>or **SC2** for 3 correct answers in wrong order |

**Question 72**

| 44 300 cao | 3 | **M1** for $50\,000 \times (0.97)^4$ oe<br>and<br>**B1** for 44260 or better<br><br>or<br>**SC1** for correct method for 3% increase with final answer of 56300 |

**Question 73**

$\dfrac{25}{9}$      **B1**    (Alt) $\dfrac{25}{9}$

$\dfrac{a}{b} \times \dfrac{6}{5}$ where $a > b$      **M1**    $\dfrac{their\,25 \times 2}{9 \times 2} \div \dfrac{5 \times 3}{6 \times 3}$ oe

*Their* $\dfrac{150}{45}$ or      **M1FT dep**    $\dfrac{their\,25 \times 2}{5 \times 3}$ oe or

*their* correct full cancelling      $\dfrac{50}{18} \div \dfrac{15}{18}$ oe with 18's cancelled

$\dfrac{10}{3}$ or $3\dfrac{1}{3}$   nfww      **A1**

**Question 74**

95      **4**    **B1** for 2.3 or $2\dfrac{18}{60}$

     **M1** for $75 \div 30$ $(= 2.5)$

     **M1** for $\dfrac{381 + 75}{their\ 2.3 + their\ 2.5}$

**Question 75**

168      **2**    **M1** for $240 \div (7 + 3)$ or better

**Question 76**

18.45      **1**    If 0 scored, **SC1** for 6.15 **and** 6.25 seen
18.75      **1**    or for correct answers reversed

**Question 77**

1.60 cao      **3**    **B2** for 1.597…. or 1.6
     or **M1** for $2 \div 1.252$

## Question 78

$$\frac{15}{8}$$     **B1**    or $\frac{135}{72}$

$their \dfrac{15}{8} \times \dfrac{9}{5}$ oe     **M1**    or $\dfrac{135}{72} \div \dfrac{40}{72}$ or equivalent division with fractions with common denominators

$\dfrac{27}{8}$ or $3\dfrac{3}{8}$ cao     **A1**

## Question 79

20.6 or 20.58 to 20.59     **3**    **M2** for $\dfrac{85-67.5}{85} \times 100$ or $\left(1 - \dfrac{67.5}{85}\right) \times 100$

or **M1** for $\dfrac{85-67.5}{85}$ or $\dfrac{67.5}{85} \times 100$

If zero scored **SC1** for $\dfrac{67.5-85}{85} \times 100$

## Question 80

**(a)**    5     **3**    **M2** for $\dfrac{u \times 10}{2} + 2u \times 10 = 125$ oe

or **M1** for evidence that area represents distance e.g. $\dfrac{u \times 10}{2}$, $2u \times 10$ or $3u \times 10$

**(b)**    2     **1FT**    **FT** $10 \div their\ u$ correctly evaluated

## Question 81

$5.34 \times 10^7$     **1**

## Question 82

9 [h] 30 [min] cao     **1**

## Question 83

**(a)**    7     **1**

**(b)**    Any number except 3, 7 or 20     **1**

**Question 84**

| | | |
|---|---|---|
| $2n^2 + 3$ oe final answer | 2 | **M1** for a quadratic expression as final answer<br><br>or $2n^2 + 3$ oe in working |

**Question 85**

| | | |
|---|---|---|
| $\dfrac{23}{90}$ oe, must be fraction | 2 | **M1** for $25.\dot{5} - 2.\dot{5}$ oe e.g. $2.55^r - 0.25^r$<br><br>or **B1** for $\dfrac{k}{90}$ |

**Question 86**

| | | |
|---|---|---|
| 7 | 2 | **B1** for 120.5 or 113.5 seen |

**Question 87**

| | | |
|---|---|---|
| $\dfrac{8}{3}$ | **B1** | or $\dfrac{40}{15}$ accept $\dfrac{3}{8}$ or $\dfrac{15}{40}$ |
| $\dfrac{4}{5} \times their \dfrac{3}{8}$ oe | **M1** | or $\dfrac{12}{15} \div their \dfrac{40}{15}$ or equivalent division with fractions with common denominators |
| $\dfrac{3}{10}$ cao | **A1** | |

**Question 88**

| | | | |
|---|---|---|---|
| **(a) (i)** | 0.5 or $-0.5$ or $\dfrac{1}{2}$ or $-\dfrac{1}{2}$ | 1 | |
| **(ii)** | 4 | 1 | |
| **(b)** | 1.37 or 1.37[4…] | 1 | |

Question 89

| | | | |
|---|---|---|---|
| **(a)** | $0.4$ or $\dfrac{2}{5}$ | 1 | |
| **(b)** | 1430 | 3 | **M2** for correct, complete, area statement<br>e.g. $120 \times 10 + \dfrac{1}{2} \times 20 \times 8 + \dfrac{1}{2} \times 30 \times 10$ oe<br>or **M1** for one area calculation<br>e.g. $10 \times 120$ or $\dfrac{1}{2} \times 20 \times 8$ or $\dfrac{1}{2} \times 30 \times 10$ |
| **(c)** | 11.9 or 11.91 to 11.92 | 1FT | *their* **(b)** ÷ 120 |

Question 90

| | | |
|---|---|---|
| 9.5 | 1 | |

Question 91

| | | |
|---|---|---|
| 7.37 or 7.371... | 1 | |

Question 92

| | | |
|---|---|---|
| $2.7 \times 10^5$ | 1 | |

Question 93

| | | |
|---|---|---|
| 44 | 2 | **B1** for 75.5 or 119.5 seen |

Question 94

| | | |
|---|---|---|
| $\dfrac{9}{5}$ | **B1** | or $\dfrac{63}{35}$ |
| *their* $\dfrac{9}{5} \times \dfrac{7}{3}$ or $\dfrac{9 \times 7}{5 \times 3}$ | **M1** | or *their* $\dfrac{63}{35} \div \dfrac{15}{35}$ or equivalent division with fractions with common denominators |
| $\dfrac{21}{5}$ or $4\dfrac{1}{5}$ cao | **A1** | |

Question 95

| | | |
|---|---|---|
| 2520 | 3 | **M2** for $12 \times (1 + 6) \div 2$ oe<br><br>or **M1** for 1 area correct<br><br>If zero scored **B1** for top speed = 720 m per min<br>or total time = 360 sec |

## Question 96

| | | | |
|---|---|---|---|
| (a) | $4n$ oe final answer | 1 | |
| (b) | $3n^2 + 8$ oe final answer | 2 | **M1** for a quadratic expression as final answer or $3n^2 + 8$ oe in working |

## Question 97

| | | |
|---|---|---|
| 72 | 3 | **M2** for $\dfrac{1280}{64} \times \dfrac{60 \times 60}{1000}$ <br><br> **M1** for working out distance ÷ speed <br> e.g. figs 1280 ÷ 64 or figs $\dfrac{1280}{their\ speed}$ <br><br> or for working out km/h to m/s conversion <br> e.g. $64 \times \dfrac{1000}{60 \times 60}$ oe <br><br> or $their\left(\dfrac{1280}{64}\right) \times \dfrac{60 \times 60}{1000}$ oe |

## Question 98

| | | |
|---|---|---|
| 1597 cao | 4 | **B3** for 1597.39.. or 1597.3[9...] or 1597.4 or 6597 <br><br> or **B2** for 6597.3[9...] or 6597.4 <br><br> or **B1** for $5000\left(1 + \dfrac{2}{100}\right)^{14}$ <br><br> If **B1** scored <br> or <br> **B0** scored and an attempt at compound interest is shown <br> **SC1** for *their* 6597[...] − 5000 evaluated correctly provided answer positive <br> and <br> **SC1** for *their* final answer rounded correctly to nearest $ from their more accurate answer |

## Question 99

| | | | |
|---|---|---|---|
| (a) | $2 \times 3 \times 5$ | 2 | **B1** for 2, 3, 5 as prime factors |
| (b) | 90 | 2 | **B1** for 90$k$ <br> or for listing multiples of each up to 90 <br> or $2 \times 3^2 \times 5$ |

Question 100

170 cao | 1 |

Question 101

[0].101 or [0].1005 to [0].1006 | 1 |

Question 102

[0].00017 | 1 |

Question 103

| (a) | 12, 15 | 1 |
| (b) | 11, 13 | 1 |

Question 104

| (a) | 625 | 1 |
| (b) | 9 | 1 |

Question 105

Any two of $\frac{8}{12}, \frac{2}{12}$ or $\frac{3}{12}$ oe | **M1** | **M1** for any 2 correct over a common denominator e.g. $\frac{4}{6}$ and $\frac{1}{6}$

$\frac{8}{12} + \frac{2}{12} - \frac{3}{12}$ oe | **M1** | or **SC2** for final answer $\frac{13}{12}$ or $1\frac{1}{12}$ with full working

$\frac{7}{12}$ | **A1** |

Question 106

18 cao nfww | 3 | **M2** for $\frac{877.5}{7.5 \times 6.5}$
or **B1** for any two of 877.5, 7.5 and 6.5 seen

Question 107

| | | | |
|---|---|---|---|
| **(a)** | 12.5 oe | **2** | **M1** for $45 \times 1000 \div 60 \div 60$ oe |
| **(b)** | 1.25 oe | **1FT** | **FT** *their* **(a)** $\div 10$ |
| **(c)** | 312.5 oe | **3FT** | **FT** for $25 \times$ *their* **(a)**<br>**M2** for $20 \times$ *their* $12.5 + 0.5 \times 10 \times$ *their* $12.5$ oe<br>or **M1** for one correct relevant area calculation<br><br>or **SC2** for final answer 1125 |

Question 108

| | | |
|---|---|---|
| 17 | **1** | |

Question 109

| | | |
|---|---|---|
| 694 or 694.4[4...] | **2** | **M1** for $950 \div 1.368$ |

Question 110

| | | |
|---|---|---|
| 3826 or 3826.38 | **2** | **M1** for $8000 \times \left(1 - \dfrac{10}{100}\right)^7$ oe |

Question 111

| | | |
|---|---|---|
| 54 | **3** | **M2** for $14.4 \times \dfrac{15}{4}$ oe<br><br>or **M1** for $14.4 \div 4$ or $\dfrac{4}{15}$ associated with 14.4<br>If zero scored **SC1** for final answer 19.6[4] |

Question 112

| | | |
|---|---|---|
| $2\dfrac{3}{12}$ or $1\dfrac{15}{12}$ or $\dfrac{27}{12}$ or $\dfrac{9 \times 3}{4 \times 3}$ | **M1** | Accept any correct conversion with common denominator $12k$ |
| *their* $\left(\dfrac{27}{12} - \dfrac{11}{12} = \dfrac{16}{12}\right)$ oe | **M1** | Correct resolving of *their* subtraction with denominator $12k$ showing full working |
| $1\dfrac{1}{3}$ or $\dfrac{4}{3}$ cao | **A1** | Working and then simplified answer must both be seen |

**Question 113**

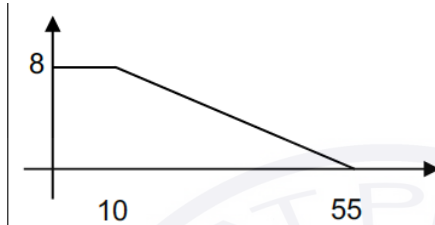| | | |
|---|---|---|
| 16.2 <br><br> 16.6 nfww | 3 | **M1** for two of 2.35, 5.75, 2.45, 5.85 seen <br> or $2 \times (5.8 - 0.05 + 2.4 \quad 0.05)$ <br> or $2 \times (5.8 + 0.05 + 2.4 + 0.05)$ <br> **A1** 16.2 or 16.6 in either answer space <br> If zero scored **SC2** for both correct reversed answers provided 16.6 nfww |

**Question 114**

**(a)**

**B1** line from (0, 8) to (10, 8)

**B1** line from *their* (10, 8) to (55, 0)

**(b)** 260

| | |
|---|---|
| 3FT | **M2FT** for $8 \times 10 + 0.5 \times 8 \times 45$ oe <br> or for a fully correct area calculation for *their* graph <br><br> or **M1FT** for $8 \times 10$ or $0.5 \times 8 \times 45$ or for one correct area calculation for *their* graph |

**Question 115**

| | |
|---|---|
| [+]17 | 1 |

**Question 116**

| | | |
|---|---|---|
| 628 | 2 | **M1** for $\dfrac{785}{1+4}[\times 4]$ |

**Question 117**

| | | |
|---|---|---|
| $\dfrac{\sqrt{4} \times 30}{9 - 3}$ | **M1** | Allow one error and 2 for $\sqrt{4}$ and 6 for $9 - 3$ |
| 10 nfww | **A1** | |

**Question 118**

| | | |
|---|---|---|
| 18 | 2 | **M1** for $36 = 2 \times 2 \times 3 \times 3$ soi <br> or $90 = 2 \times 3 \times 3 \times 5$ soi <br> or listing the correct factors of 36 and 90 showing a minimum of 2, 3, 6, 9 and 18 |

## Question 119

$\dfrac{14}{90}$ oe must be fraction

**2**

**M1** for $15.\dot{5}-1.\dot{5}$ oe

or

**B1** for $\dfrac{k}{90}$

## Question 120

19 nfww

**4**

**B3** 19.3 or 19.28 to 19.29

or

**M2** for $\dfrac{300\times 60^2}{56\times 1000}$ oe

or

**M1** for distance divided by speed

e.g. *their* 300 ÷ *their* 56 or $\dfrac{56\times 1000}{60^2}$

If **B0** then **B1** for seeing their answer in decimal form correctly written to the nearest integer

## Question 121

198

**4**

**B3** for 197.7…. or answer 198.00

or

**M2** for $1800\times\left(1+\dfrac{1.5}{100}\right)^7-1800$

or

**B2** for answer 1998

or

**M1** for $1800\times\left(1+\dfrac{1.5}{100}\right)^7$

If **B0** then **B1** for seeing their answer in decimal form correctly written to the nearest integer

## Question 122

$\dfrac{4}{9}$ oe, must be fraction

**2**

**M1** for $10\times 0.\dot{4}-0.\dot{4}$ oe

## Question 123

$\dfrac{35(or\ 95)}{60}+\dfrac{39}{60}$

$2\dfrac{7}{30}$

**M1**

**A2**

accept $\dfrac{35k(or\ 95k)}{60k}+\dfrac{39k}{60k}$

or **A1** for $\dfrac{67}{30}$ or $\dfrac{134k}{60k}$ or $1\dfrac{74k}{60k}$ or $2\dfrac{14k}{60k}$

## Question 124

| | | | |
|---|---|---|---|
| 87 cao nfww | | 3 | **B2** for 87.04…. or 87.0 nfww<br>or<br>**M1** for 500.5 or 5.75 seen<br>or for $(500 + 0.5) \div (5.8 - 0.05)$<br>and **B1** for **truncating** their decimal answer to an integer |

## Question 125

| | | | |
|---|---|---|---|
| **(a)** | $2^5 \times 3^2 \times 7$ oe final answer | 3 | **B2** for product of two of $2^5$, $3^2$, 7<br><br>or **B1** for 2, 3 and 7 seen<br><br>or **M1** for $2 \times 1008$<br>or $3 \times 672$ or $7 \times 288$ soi |
| **(b)** | $2.016 \times 10^3$ | 1 | |

## Question 126

| | | | |
|---|---|---|---|
| **(a)** | $9a + 3b$ | 1 | |
| **(b)** | $36a + 6b = 96$ or $9a + 3b = 21$ | **B1** | |
| | for correct method to eliminate one variable | **M1** | |
| | $a = 3$<br>$b = -2$ | **A1**<br>**A1** | If **M0 A0 A0** scored **SC1** for<br><br>2 values satisfying $36a+6b=96$ or $9a+3b=21$<br>or<br>if no working shown, but 2 correct answers given |

## Question 127

| | | |
|---|---|---|
| 17 | 1 | |

## Question 128

| | | |
|---|---|---|
| 71000 cao | 1 | |

## Question 129

| | | |
|---|---|---|
| $\dfrac{1}{12} \times \dfrac{6}{5}$ oe | **M1** | Must be shown |
| $\dfrac{1}{10}$ final answer cao | **A1** | |

**Question 130**

$\dfrac{29}{90}$ oe, must be a fraction

2

**M1** for $32.\dot{2}-3.\dot{2}$

or **B1** for $\dfrac{k}{90}$

**Question 131**

14

2

**M1** for $56 = 2{\times}2{\times}2{\times}7$ soi
or $70 = 2{\times}5{\times}7$ soi
or $2{\times}7$ as final answer

**Question 132**

| (a) | 10.4675 cao nfww | 2 | **B1** for 3.95 **or** 2.65 seen |
| | | | or **M1** for $(4.0 - 0.05) \times (2.7 - 0.05)$ |
| (b) | 34 nfww | 2 | **B1** for 7.65 **or** 0.225 seen |
| | | | or **M1** for $(7.6 + 0.05) \div (0.23 - 0.005)$ |

**Question 133**

| (a) | 57 122 | 2 | **M1** for $20\,000 \times (1+\frac{30}{100})^4$ oe |
| (b) | 15 | 2 | **M1** for two substitutions greater than 4 e.g. |
| | | | $20\,000 \times (1+\frac{30}{100})^k$ where $k > 4$ |

**Question 134**

$5.74 \times 10^{-5}$

1

**Question 135**

5.89 or 5.885 to 5.886

1

**Question 136**

3.590 cao

1

**Question 137**

| (a) | 9 and 16 | 1 |
| (b) | 11 | 1 |

**Question 138**

$\dfrac{11}{30}$ cao

3

**B2** for $\dfrac{33}{90}$ oe as final answer

or **M1** for $36.\dot{6}-3.\dot{6}$ or $36.6^r - 3.6^r$ oe

or **B1** for $\dfrac{k}{90}$

**Question 139**

| | | | |
|---|---|---|---|
| 10 cao nfww | | **3** | **M2** for 42.5 × 2 ÷ 8.5 allowing one error in the UB or LB provided it is still UB × 2 ÷ LB or **M1** for one of 42.5 or 8.5 seen as bounds |

**Question 140**

| | | |
|---|---|---|
| $\dfrac{21}{8} \times \dfrac{3}{7}$ oe | **M1** | Must be shown |
| $1\dfrac{1}{8}$ cao final answer | **A2** | **A1** for $\dfrac{9}{8}$ oe e.g. $\dfrac{63}{56}$ |

**Question 141**

| | | | |
|---|---|---|---|
| **(a)** | $3n + 13$ oe final answer | **2** | **M1** for $3n + c$ or $kn + 13$ |
| **(b)** | $3^{n-1}$ oe final answer | **2** | **M1** for recognition of terms being powers of 3 |

**Question 142**

| | | | |
|---|---|---|---|
| **(a)** | 7.74 or 7.738 to 7.739 [ billion] | **2** | **M1** for $7.23 \times \left(1 + \dfrac{1.14}{100}\right)^{6}$ |
| **(b)** | 2042 | **2** | **B1** for 28 or 28.6…or 29  or answer 2043 |

**Question 143**

| | | |
|---|---|---|
| 8(h) 52 (min) | **1** | |

**Question 144**

| | | |
|---|---|---|
| 3.75 or 3¾ | **1** | |

**Question 145**

| | | |
|---|---|---|
| [0].00127 | **1** | |

**Question 146**

| | | |
|---|---|---|
| 157 900 cao | **2** | **B1** for 158000 or 157860 or 157862 to 157863<br><br>If zero scored, **SC1** for *their* answer to more than 4 figs correctly rounded to 4 sf |

**Question 147**

| | | |
|---|---|---|
| 393 | **2** | **B1** for 393.1 to 393.2 or **M1** for 2000 ÷ 5.087 |

**Question 148**

| 144 | 2 | **M1** for finding a correct product of prime factors<br> or correctly listing a minimum of 3 multiples of 36 **and** 48<br> or for answer $2^4 \times 3^2$ oe or $144k$ |

**Question 149**

| 28.35 cao | 2 | **B1** for 9.45 seen<br> or **M1** for $(9.4 + 0.05) \times 3$ |

**Question 150**

| **(a)** | $-3$ | 1 | |
| **(b)** | $9 - 2n$ oe | 2 | **B1** for $-2n + k$ or $dn + 9$ where $d \neq 0$ |

**Question 151**

| $\dfrac{6}{7} \times \dfrac{3}{5}$ or $\dfrac{18}{21} \div \dfrac{35}{21}$ oe | **M2** | **B1** for $\dfrac{5}{3}$ oe<br><br>or **M1** for $\dfrac{6}{7} \times$ *their* $\dfrac{3}{5}$ |
| $\dfrac{18}{35}$ cao | **A1** | |

**Question 152**

| 1.38 or 1.381 to 1.382 | 3 | **M2** for $(36 + 4.3) \div (105 \times \dfrac{1000}{60 \times 60})$ oe<br><br>or **M1** for $105 \times \dfrac{1000}{60 \times 60}$ or for a distance ÷ a speed<br><br>or **SC2** for answer 1.23(4...) |

**Question 153**

| **(a)** | $2.47 \times 10^6$ | 1 | |
| **(b)** | $7.9 \times 10^{-3}$ | 1 | |

**Question 154**

| $\dfrac{18}{30}$ and $\dfrac{5}{30}$ oe must be shown | **M1** | $\dfrac{18k}{30k}$ and $\dfrac{5k}{30k}$ |
| $\dfrac{23}{30}$ cao | **A1** | |

**Question 155**

$0.4^2 \quad 0.6^3 \quad 0.22 \quad \sqrt{0.09}$ | **2** | **M1** for decimal conversion 0.216 and 0.3 and 0.16

**Question 156**

4.25
4.15 | **2** | **B1** for each or both answers reversed

**Question 157**

| **(a)** | $A$ | **1** |
| **(b)** | A ruled line joining (65, 23) to (80, 28) | **1** |

**Question 158**

| **(a)** | 2.9[0] or 2.900 to 2.901 | **1** |
| **(b)** | 3.17 or 3.172 to 3.173 | **1** |

**Question 159**

18 360 | **2** | **M1** for $34\,000 \times \left(1 - \dfrac{40}{100}\right) \times \left(1 - \dfrac{10}{100}\right)$ oe

**Question 160**

$\dfrac{2}{9}$ oe, must be a fraction | **2** | **M1** for $2.\dot{2} - 0.\dot{2}$ oe

or **B1** for $\dfrac{k}{9}$

**Question 161**

| **(a)** | 15000 cao | **1** | |
| **(b)** | $1.5 \times 10^4$ | **1FT** | FT *their* **(a)** |

**Question 162**

72.25 cao | **2** | **M1** for 8 + 0.5 or better seen

**Question 163**

| **(a)** | 38 | **2** | **M1** for 57 ÷ (2 + 1) or better |
| **(b)** | 12 : 7 | **2** | **M1FT** for *their* 38 − 2 **and** *their* 19 + 2 seen dep on sum = 57 If M0 **SC1** for answer 7 : 12 |

## Question 164

| | | | |
|---|---|---|---|
| Common denominator 24 | **B1** | accept $k \times 24$ | |
| Two correct from $\dfrac{18}{24}$, $\dfrac{16}{24}$ and $\dfrac{3}{24}$ oe | **M1** | accept $\dfrac{18k}{24k}$, $\dfrac{16k}{24k}$ and $\dfrac{3k}{24k}$ | |
| $1\dfrac{7}{24}$ cao | **A2** | **A1** for $\dfrac{31}{24}$ or $\dfrac{31k}{24k}$ or $1\dfrac{7k}{24k}$ | |

## Question 165

| | |
|---|---|
| $-7$ | **1** |

## Question 166

| | | |
|---|---|---|
| **(a)** | [0].0402 | **1** |
| **(b)** | [0].040 | **1** |

## Question 167

| | | |
|---|---|---|
| [0].67 | **2** | **M1** for $14 \times 0.905$ [$-12$] or 12.67 |
| | | If zero scored, **SC1** for answer [0].74[0] |

## Question 168

| | | |
|---|---|---|
| $\dfrac{8}{12}$ and $\dfrac{3}{12}$ oe | **M1** | Correct fractions with common denominator |
| $\dfrac{5}{12}$ cao | **A1** | |

## Question 169

| | | |
|---|---|---|
| **(a)** | $\dfrac{1}{125}$ | **1** |
| **(b)** | $4.56 \times 10^{-3}$ | **1** |

**Question 170**

(a) $\dfrac{1}{8}$ cao | 1

(b) $\dfrac{2}{11}$ | 2 | **M1** for $18.\dot{1}\dot{8}-0.\dot{1}\dot{8}$ oe
or **B1** for $\dfrac{2k}{11k}$ ($k$ not 0 or 1)

**Question 171**

(a) $6n+1$ oe  final answer | 2 | **B1** for $6n+c$ or for $kn+1$ ($k\ne 0$)

(b) $(n+2)^2$  final answer | 2 | **M1** for any quadratic expression or reaching second difference of 2

**Question 172**

(a) $\dfrac{3mx}{50}$ or $0.06mx$ | 2 | **M1** for $m\times x\times 60\div 1000$ oe

(b) $35$ | 2 | **M1** for $5\times x\times 60\div 1000=10.5$ oe or for substituting $m=5$ in *their* (a) and equating to 10.5 oe

**Question 173**

$\dfrac{10\times 20}{90-40}$ | **M1**

4 nfww | **A1**

**Question 174**

4 nfww | 2 | **M1** for $[7.31=]\,7\left(1+\dfrac{1.1}{100}\right)^{k}$ oe

**Question 175**

$10^{k}\times 0.1\dot{7}-[10]\times 0.1\dot{7}\ \ k\geqslant 1$ oe | **M1**

$\dfrac{16}{90}$ or $\dfrac{8}{45}$ oe nfww | **A1**

**Question 176**

70.7625 cao and 72.4625 cao | 3 | **B2** for 70.7625 or 72.4625
or **M2** for $9.25\times 7.65$ **and** $9.35\times 7.75$
or **B1** for two of 9.25, 9.35, 7.65, 7.75 seen

**Question 177**

| | | |
|---|---|---|
| $\dfrac{10}{3}$ or $\dfrac{5}{2}$ | **B1** | oe improper fractions |
| *their* $\dfrac{10}{3}$ × *their* $\dfrac{2}{5}$ | **M1** | accept $\dfrac{20}{6} \div \dfrac{15}{6}$ |
| $1\dfrac{1}{3}$ cao | **A1** | |

**Question 178**

| | | |
|---|---|---|
| 1050 | 3 | **M2** for $924 \div \dfrac{(100-12)}{100}$ oe<br>or **M1** for 88[%] associated with 924 oe |

**Question 179**

| | | | |
|---|---|---|---|
| **(a)** | 0.25 or $\dfrac{1}{4}$ | 1 | |
| **(b)** | 0.45 | 3 | **B2** for 450<br>or<br>**M2** for $\dfrac{1}{2} \times 60 \times 15 \div 1000$<br>or **M1** for $\dfrac{1}{2} \times 60 \times 15$<br>If 0 scored **SC1** for correct conversion of their distance in metres to kilometres |

**Question 180**

| | | |
|---|---|---|
| 0.407 or 0.4067... | 1 | |

**Question 181**

| | | |
|---|---|---|
| 120 | 2 | **M1** for finding a correct product of prime factors or correctly listing a minimum of 3 multiples of 20 **and** 24<br>or for answer $2^3 \times 3 \times 5$ oe or $120k$ where $k$ is an integer > 1 |

**Question 182**

| | | |
|---|---|---|
| $10^{k+2} \times [0].\dot{6}\dot{3} - 10^{k} \times [0].\dot{6}\dot{3}$ oe where $k > 1$ | **M1** | |
| $\dfrac{63}{99}$ or equivalent fraction | **A1** | e.g. $\dfrac{6300}{9900}$ but not $\dfrac{7}{11}$ |
| $\dfrac{7}{11}$ | **B1** | |

**Question 183**

| | | |
|---|---|---|
| 3000 | **3** | **M2** for $12.5 \times \dfrac{1}{2}(200 + 280)$ oe or **M1** for part area |

**Question 184**

| | | |
|---|---|---|
| common denominator 12 | **B1** | accept $k \times 12$ throughout |
| one correct from $\dfrac{9}{12}$ or $\dfrac{8}{12}$ oe | **M1** | accept $\dfrac{9k}{12k}$ or $\dfrac{8k}{12k}$ |
| $\dfrac{5}{6}$ cao | **A2** | **A1** for $\dfrac{10}{12}$ or $\dfrac{10k}{12k}$ |

## Question 185

| | | |
|---|---|---|
| 1.96 cao | 5 | **M4** for $\left(\left(\left(\sqrt[3]{\dfrac{\frac{2500\times1.6\times3}{100}+2000}{2000}}\right)-1\right)-1\right)[\times$ 100] oe or 1.96…or [0].0196… or 101.96… or 1.0196… |
| | | or |
| | | **M3** for $\sqrt[3]{\dfrac{\frac{2500\times1.6\times3}{100}+2000}{2000}}$ |
| | | or |
| | | **B2** for [SI =] 120 or [CI total=] 2120 |
| | | or **M1** for $\dfrac{2500\times3\times1.6}{100}$ |
| | | and |
| | | **M1** for $2000\times(k)^3$ |

## Question 186

| | |
|---|---|
| [0].072 | 1 |

## Question 187

| | |
|---|---|
| [0].62 | 1 |

## Question 188

| | |
|---|---|
| [0].394 or [0].3944 to [0].3945 | 1 |

## Question 189

| | |
|---|---|
| 41.9 or 41.87 | 1 |

## Question 190

| | | |
|---|---|---|
| $\dfrac{5}{6}-\dfrac{3}{6}$ oe | M1 | oe for $\dfrac{5k}{6k}-\dfrac{3k}{6k}$ |
| $\dfrac{1}{3}$ cao final answer | A1 | |

## Question 191

| | | |
|---|---|---|
| (a) | $6.05\times10^{-2}$ | 1 |
| (b) | $5.1\times10^{3}$ | 1 |

## Question 192

| (a) | 25 | 1 |
| --- | --- | --- |
| (b) | 9 | 1 |

## Question 193

| 2859.75   2968.75 cao<br>final answer | 3 | **B2** for one correct seen<br>or **B1** for 62.5 or 61.5 or 46.5 or 47.5 seen<br>or **M1** for $(62 + 0.5) \times (47 + 0.5)$<br>or $(62 - 0.5) \times (47 - 0.5)$ |
| --- | --- | --- |

## Question 194

| 2 | 1 |
| --- | --- |

## Question 195

| (a) | 23.46 cao | 1 |
| --- | --- | --- |
| (b) | 20 cao | 1 |

## Question 196

| (a) | Chicago | 1 |
| --- | --- | --- |
| (b) | $-3$ | 1 |

## Question 197

| $\dfrac{14\,(\text{or}\,35)}{21} + \dfrac{15}{21}$ | **M1** | accept $\dfrac{14k\,(\text{or}\,35k)}{21k} + \dfrac{15k}{21k}$ |
| --- | --- | --- |
| $2\dfrac{8}{21}$ cao | **A2** | or **A1** for $\dfrac{50}{21}$ or $1\dfrac{8}{21}$ or $\dfrac{29}{21}$ or $1\dfrac{29}{21}$ |

## Question 198

| (a) | $0.8$ or $\dfrac{4}{5}$ | 1 | |
| --- | --- | --- | --- |
| (b) | 1180 | 3 | **M2** for<br>$(0.5 \times 16 \times 20) + (0.5 \times 4 \times 30) + (80 \times 12)$ oe<br>or **M1** for part area |

## Question 199

| $-3$ | 1 |
| --- | --- |

## Question 200

| [0].00517 | 1 |
| --- | --- |

## Question 201

| (a) | 2, 3, 4, 6 | 1 |
| --- | --- | --- |
| (b) | 27, 36  cao | 1 |

## Question 202

| 2.5 | 2 | **B1** for 2200 or 0.055 seen<br>or **SC1** for answer figs 25 |

## Question 203

| 16.5 | 2 | **M1** for $\dfrac{55}{60}$<br>or speed × time (numerical) |

## Question 204

| $1.32 \times 10^{41}$ | 2 | **M1** for $0.12 \times 10^{41}$ or $12 \times 10^{40}$<br>or **SC1** for figs 132 |

## Question 205

| 20.75 final answer cao | 2 | **B1** for one of 5.15, 6.25 or 9.35 seen<br>or **M1** for<br>$(5.2 - 0.05) + (6.3 - 0.05) + (9.4 - 0.05)$ |

## Question 206

| $48.\overset{\cdot}{4}\overset{\cdot}{8} - 0.\overset{\cdot}{4}\overset{\cdot}{8}$ oe | **M1** | **SC1** for $\dfrac{48}{99}$ or $\dfrac{16}{33}$ or equivalent fraction with no/insufficient working |
| $\dfrac{48}{99}$ or $\dfrac{16}{33}$ or equivalent fraction | **A1** | |

## Question 207

| (a) | $3\dfrac{2}{3}$ cao | 1 | |
| (b) | $\dfrac{3}{12}[\text{and}\dfrac{5}{12}]$ oe | **M1** | For correct method to find common denominator<br>e.g. $\dfrac{12}{48}$ and $\dfrac{20}{48}$ |
| | $\dfrac{2}{3}$ cao | **A1** | |

## Question 208

| 5(a) | −1 | 1 | |
| 5(b) | $-6n + 29$ oe | 2 | **M1** for $-6n + k$ (any $k$) or $-kn + 29$ ($k \ne 0$) |

## Question 209

| 132 | 3 | **M2** for $\dfrac{1}{2}(7 + 15) \times 12$<br><br>or **M1** for any correct area |

## Question 210

| | | |
|---|---|---|
| 2 | 1 | |

## Question 211

| (a) | 1.49220…. | 1 | |
|---|---|---|---|
| (b) | 1.5 | 1FT | FT *their* answer to **(a)** rounded correctly to 2 significant figures |

## Question 212

| | | |
|---|---|---|
| Diagonal line from (0, 0) to (30, 12) | 1 | |
| and<br><br>Horizontal line from (30, 12) to (70, 12) | 1FT | FT for horizontal line from (30, $k$) to (70, $k$) where $k$ is *their* 12 |

## Question 213

| | | |
|---|---|---|
| 19.65 cao | 2 | **B1** for 6.55 seen (must be evaluated, not 6.5 + 0.05)<br>or **M1** for 3 × (6.5 + 0.05) |

## Question 214

| | | |
|---|---|---|
| 7615.15 | 2 | **M1** for $12\,400 \times \left(1 - \dfrac{15}{100}\right)^3$ oe |

## Question 215

| $\dfrac{5}{3}$ | $\dfrac{2}{3} + \dfrac{4}{15}$ | **B1** | Allow $\dfrac{5k}{3k}$ |
|---|---|---|---|
| $\dfrac{25}{15}$ [and $\dfrac{11}{15}$] | $\dfrac{10}{15}$ [and $\dfrac{4}{15}$] | **M1** | Correct method to find common denominator e.g. $\dfrac{75}{45}$ and $\dfrac{33}{45}$<br>Follow through *their* $\dfrac{5}{3}$ for the **M1** mark |
| $\dfrac{14}{15}$ cao | $\dfrac{14}{15}$ cao | **A1** | |

## Question 216

| 2(a) | 343 | 1 | |
|---|---|---|---|
| 2(b) | −11 | 1 | |
| 2(c) | 343 | 1 | |

**Question 217**

| Positive | 1 |

**Question 218**

| $5.23 \times 10^{-5}$ | 1 |

**Question 219**

| 2.29 or 2.292… | 1 |

**Question 220**

| $\dfrac{8}{9}$ oe, must be fraction | 1 |

**Question 221**

| 21400 or 21430 or 21434.[…] | 2 | **M1** for $23000 \times \left(1 - \dfrac{1.4}{100}\right)^5$ oe |

**Question 222**

| 92 | 3 | **M2** for $[600-](0.18 \times 600 + \dfrac{2}{3} \times 600)$ <br> or **M1** for 108 or 400 seen |

**Question 223**

| common denominator 24 | **B1** | accept $24k$ |
| --- | --- | --- |
| $\dfrac{21}{24}$ and $\dfrac{4}{24}$ oe | **M1** | |
| $1\dfrac{1}{24}$ | **A1** | |

**Question 224**

| $-5$ | 1 |

**Question 225**

| 6.15 or 6.153 to 6.154 or $6\dfrac{2}{13}$ | 1 |

**Question 226**

| 3, 4, 6, 9, 12, 18 | 2 | **B1** for list with one or two errors or omissions <br><br> or for a complete list of products |

**Question 227**

| 25.3[0] | 2 | M1 for $22 \times \dfrac{15}{100}$ oe or better |
|---|---|---|

**Question 228**

| (a) | [0].004 82 cao | 1 | |
|---|---|---|---|
| (b) | $5.2 \times 10^7$ | 1 | |

**Question 229**

| $\dfrac{6}{5}$ | B1 | accept equivalent fractions e.g. $\dfrac{18}{15}$ |
|---|---|---|
| $\dfrac{2}{3} \times$ *their* $\dfrac{5}{6}$ | M1 | or $\dfrac{10}{15} \div \dfrac{18}{15}$ oe |
| $\dfrac{5}{9}$ cao | A1 | |

**Question 230**

| (a) | 50 cao nfww | 2 | B1 12.5 seen<br>or M1 for $12 + 0.5$ or better |
|---|---|---|---|
| (b) | 12.3 | 1 | |

**Question 231**

| 2 [h] 55 [min] | 1 |
|---|---|

**Question 232**

| [a =] 15<br>[b =] −27 | 2 | B1 for each<br>or SC1 for reversed answers |
|---|---|---|

**Question 233**

| 24 | 2 | B1 for 17 or 41 identified |
|---|---|---|

**Question 234**

| $\dfrac{8}{12}$ and $\dfrac{1}{12}$ oe | M1 | For correct fractions with a common denominator $12k$ |
|---|---|---|
| $\dfrac{7}{12}$ cao | A1 | |

**Question 235**

| (a) | $1.36 \times 10^6$ oe | 1 | |
|---|---|---|---|
| (b) | $5.21 \times 10^{-3}$ oe | 1 | |

**Question 236**

7 cao nfww

2 | **B1** for $31 + 0.5$ or $5 - 0.5$ or 31.5 or 4.5 seen

**Question 237**

30

3 | **M2** for $\frac{1}{2}(8 + 2) \times v \,[\,= 150\,]$ oe
or **M1** for $\frac{1}{2} \times 6 \times v$ or $2 \times v$ oe

**Question 238**

23 or 29

1

**Question 239**

$3.87 \times 10^{-5}$

1

**Question 240**

$\dfrac{7}{11}$ oe

1

**Question 241**

| (a) | 6.58331… | 1 | |
| (b) | 6.5833 | 1 | **FT** *their* (a) correctly rounded to 4 dp |

**Question 242**

$\dfrac{4}{7}$ oe exact answer

2 | **B1** for 4 or $\dfrac{1}{7}$

**Question 243**

$\dfrac{3}{10}$

**Question 244**

| (a) | 2200 | 3 | **M2** for $\frac{1}{2}(90 + 130) \times 20$ or $\frac{1}{2}(10 \times 20) + (90 \times 20) + \frac{1}{2}(30 \times 20)$ or **M1** for one area |
| (b) | 16.9 or 16.92… | 1 | **FT** *their* (a) $\div 130$ |

**Question 245**

126

1

**Question 246**

2

1

**Question 247**

| | |
|---|---|
| 6.59 or 6.594 to 6.595 | **1** |

**Question 248**

| | |
|---|---|
| $\dfrac{9}{25}$ oe | **1** |

**Question 249**

| (a) | 5 000 207 | **1** |
|---|---|---|
| (b) | $8.13 \times 10^{-3}$ | **1** |

**Question 250**

| (a) | 0.076 cao | **1** |
|---|---|---|
| (b) | 10 000 cao | **1** |

**Question 251**

$\dfrac{3}{8}$

**Question 252**

| | | |
|---|---|---|
| 6.5[0] nfww final answer | **2** | **M1** for 42.5 − 0.25 implied by 42.25 |

**Question 253**

| | | |
|---|---|---|
| 1.88… − 0.188.. oe | **M1** | e.g. 18.88… − 1.88… or 18.88… − 0.188… |
| $\dfrac{17}{90}$ or equivalent fraction | **B1** | |

**Question 254**

| | | |
|---|---|---|
| 600 | **3** | **M2** for $\dfrac{108 \times 1000 \times 20}{60 \times 60}$ oe<br>or **M1** for $\dfrac{108 \times 1000}{60 \times 60}$ oe<br>or for figs108 × time oe |

Question 255

| (a) | 1.2 | 1 | |
|-----|-----|---|---|
| (b) | 45 | 3 | **M2** for $\frac{1}{2} \times 10 \times 12 + 12(T-10)[= 480]$ oe <br> or **M1** for one relevant area <br> OR <br> **M1** for $480 - \frac{1}{2} \times 10 \times 12$ implied by 420 <br> **M1** for $\frac{420}{12}$ [+ 10] |

Question 256

| $2.3 \times 10^4$ | 1 |
|-------------------|---|

Question 257

| 4 | 1 |
|---|---|

Question 258

| $\left[\dfrac{1}{15} + \right]\dfrac{2 \times 3}{5 \times 3}$ | **M1** | or better e.g. $\left[\dfrac{1}{15} + \right]\dfrac{6}{15}$ <br> Allow any correct common denominator $15k$ |
|---|---|---|
| $\dfrac{7}{15}$ cao | **A1** | |

Question 259

| 26 600 cao | 2 | **M1** for $30000 \times \left(1 - \dfrac{2}{100}\right)^6$ oe |
|------------|---|---|

Question 260

| 34.5 and <br> 37.5 final answers | 2 | **B1** for 11.5 or 12.5 seen <br> or **M1** for $(12 - 0.5) \times 3$ or $(12 + 0.5) \times 3$ |
|---|---|---|

Question 261

| 8[h] 55[min] | 1 |
|--------------|---|

Question 262

| $7.36 \times 10^7$ | 2 | **B1** for figs 736 |
|--------------------|---|---|

Question 263

| 121 nfww | 2 | **M1** for $(6000 + 50) \div 50$ <br> or **B1** for 6050 seen |
|----------|---|---|

Question 264

896  | 3 | **M2** for $800 + \dfrac{800 \times 4 \times 3}{100}$ oe

or **M1** for $\dfrac{800 \times 4 \times 3}{100}$ oe

Question 265

−14  | 1

Question 266

330  | 1

Question 267

$\dfrac{23}{99}$  | 1

Question 268

(a) | 0.047 | 1
(b) | $2.76 \times 10^6$ | 1

Question 269

467.42 or 467  | 2 | **M1** for $500 \div 1.0697$

Question 270

$22\dfrac{2}{9}$ or 22.2 or 22.22...  | 3 | **M2** for $\dfrac{77-63}{63}[\times 100]$ oe or

$\dfrac{77}{63} \times 100\,[-100]$ oe

or **M1** for $\dfrac{77}{63}$ oe

Question 271

6290[.0...]  | 3 | **M2** for $\dfrac{6999.31}{\left(1+\dfrac{2.16}{100}\right)^5}$

or **M1** for $[A]\left(1+\dfrac{2.16}{100}\right)^5$

## Question 272

| (a) | $1\frac{2}{3}$ or 1.67 or 1.666 to 1.667 | **1** | |
|---|---|---|---|
| (b) | 1062.5 | **3** | **M2** for $\frac{25}{2}(50+35)$ oe <br> or **M1** for one area |

## Question 273

| | | | |
|---|---|---|---|
| $\frac{25}{8}$ | | **B1** | or $\frac{75}{24}$ |
| $their\ \frac{25}{8}\times\frac{12}{5}$ or $their\ \frac{75}{24}\div\frac{10}{24}$ oe | | **M1** | $\frac{75}{24}\times\frac{24}{10}$ |
| $their\ \frac{300}{40}$ oe | | **M1** | oe e.g. $\frac{1800}{240},\frac{75}{10},\frac{60}{8},\frac{30}{4},\frac{15}{2}$ |
| $7\frac{1}{2}$ cao | | **A1** | |

## Question 274

| 1.90 cao | **1** |
|---|---|

## Question 275

| $\frac{5}{24}$ or 0.208 or 0.2083… | **1** |
|---|---|

## Question 276

| 5(a) | 6 | **1** |
|---|---|---|
| 5(b) | 2.15 or 2.154… | **1** |

## Question 277

| (a) | 31 or $\sqrt{121}$ | **1** |
|---|---|---|
| (b) | $\sqrt{13}$ | **1** |

## Question 278

| $\frac{84}{315}$ or $\frac{4}{35}\times\frac{7}{3}$ or $\frac{12}{5}\times\frac{1}{9}$ or $\frac{4}{5}\times\frac{1}{3}$ | **M1** | Accept any correct cancelling |
|---|---|---|
| $\frac{4}{15}$ cao | **A1** | |

## Question 279

53 or 59 | **1**

## Question 280

0.839 or 0.8386 to 0.8387 | **1**

## Question 281

$\dfrac{7}{9}$ | **1**

## Question 282

56.4 or 56.44… | **2** | **M1** for $\dfrac{254}{their\,4.5}$ or $\dfrac{254}{their\,270}[\times 60]$

## Question 283

| (a) | 0.048 cao | | **1** |
|-----|-----------|---|---|
| (b) | $5.27 \times 10^{-3}$ | | **1** |

## Question 284

6 | **2** | **M1** for $2 \times 3^2 \times 5$ or $2^4 \times 3$
or for $2 \times 3$ as final answer
or **B1** for 2 or 3 as final answer

## Question 285

| $\dfrac{9}{4} \times \dfrac{7}{3}$ or $\dfrac{63}{28} \div \dfrac{12}{28}$ oe with common denominator | **M2** | **B1** for $\dfrac{9}{4}$ oe seen |
|---|---|---|
| | | or **M1** for $their\,\dfrac{9}{4} \times \dfrac{7}{3}$ |
| $5\dfrac{1}{4}$ cao | **A1** | |

## Question 286

495 | **3** | **M2** for $435.6 \div \dfrac{100-12}{100}$ oe
or **B1** for recognising 435.6 as 88[%]

## Question 287

7.5 oe | **1**

## Question 288

4.01 or 4.007 to 4.008 | **1**

**Question 289**

| 46.5 | | 1 | |
|------|--|---|--|

**Question 290**

| $47.77\ldots - 4.77\ldots$ oe | **M1** | |
|---|---|---|
| $\dfrac{43}{90}$ | **A1** | Allow equivalent fractions<br>If **M0** then **SC1** for $\dfrac{43}{90}$ or equivalent fraction with no/insufficient working |

**Question 291**

| (a) | 28 | 1 | |
|-----|----|---|--|
| (b) | 27 | 1 | |
| (c) | 29 or 31 | 1 | |

**Question 292**

| $\dfrac{5}{6} + \dfrac{4}{6}$ oe | **M1** | 2 correct fractions with a suitable common denominator $6k$ |
|---|---|---|
| $1\dfrac{1}{2}$ cao | **A2** | **A1** for $\dfrac{9}{6}$ oe |

**Question 293**

| (a)(i) | 17 | 1 | |
|--------|-----|---|--|
| (a)(ii) | $3n + 2$ oe final answer | 2 | **B1** for $3n + k$ or $cn + 2$, $c \neq 0$ |
| 2(b) | $\dfrac{31}{12}$ oe | 1 | |

**Question 294**

| (a) | 2 | 1 | |
|-----|------|---|--|
| (b) | 1300 | 3 | **M2** for $\dfrac{20}{2} \times (60 + 70)$ oe<br>or **M1** for any relevant area |

**Question 295**

| −10 | | 1 | |
|-----|--|---|--|

**Question 296**

| 6 | | 1 | |
|---|--|---|--|

Question 297

| (a) | 27 | 1 | |
|---|---|---|---|
| (b) | 47 | 1 | |

Question 298

| 21 | | 2 | **M1** for $[84 =] 2 \times 2 \times 3 \times 7$ or $[105 =] 3 \times 5 \times 7$ or $3 \times 7$ as final answer |
|---|---|---|---|
| | | | or **B1** for 3 or 7 as final answer |

Question 299

| (a) | $7.2 \times 10^4$ | 1 | |
|---|---|---|---|
| (b) | $1.8 \times 10^{-3}$ | 1 | |

Question 300

| (a) | $\dfrac{1}{2n}$ oe final answer | 1 | |
|---|---|---|---|
| (b) | $5^{n-1}$ oe final answer | 2 | **M1** for recognition of terms being powers of 5 |

Question 301

| $\dfrac{2}{12}$ oe or $\dfrac{1}{2} \times \dfrac{1}{3}$ | $\dfrac{2}{3}\left(1 + \dfrac{1}{4}\right)$ | **M1** | **M1** for correct first step to deal with multiplication |
|---|---|---|---|
| $\dfrac{8}{12}[+]\dfrac{2}{12}$ oe | $\dfrac{2}{3} \times \dfrac{5}{4}$ | **M1** | **M1** for correct working for common denominator with *their* $\dfrac{2}{12}$ oe or correct evaluation of bracket |
| $\dfrac{5}{6}$ cao | | **A2** | **A1** for $\dfrac{10}{12}$ oe |

Question 302

| (a) | $0.3$ or $\dfrac{3}{10}$ | | 1 | |
|-----|------|---|---|---|
| (b) | 760 | | 3 | **M2** for correct complete area statement<br>e.g. $70 \times 10 + \dfrac{1}{2} \times 20 \times 6$ oe<br>or **M1** for one of these area calculations<br>$70 \times 10$, $\dfrac{1}{2} \times 20 \times 6$, $50 \times 10$ or<br>$\dfrac{1}{2} \times (16 + 10) \times 20$ |

Question 303

| 6.8 | | 1 | |
|-----|---|---|---|

Question 304

| 7.6[0] or 7.604 to 7.605 | | 1 | |
|-----|---|---|---|

Question 305

| 440 or 440.2 to 440.3 | | 2 | **M1** for $30000 \div 68.14$ |
|-----|---|---|---|

Question 306

| $67.\dot{7} - 6.\dot{7}$ oe | | **M1** | |
|-----|---|---|---|
| $\dfrac{61}{90}$ | | **A1** | If 0 scored, **SC1** for $\dfrac{k}{90}$ |

Question 307

| $\dfrac{29}{8}$ or $\dfrac{5}{3}$ | $2\dfrac{5}{8} - \dfrac{2}{3}$ | **M1** | Allow $\dfrac{29k}{8k}$ or $\dfrac{5k}{3k}$<br>Correct step for dealing with mixed numbers |
|-----|------|---|---|
| $\dfrac{87}{24}$ and $\dfrac{40}{24}$ | $[2]\dfrac{15}{24}$ and $\dfrac{16}{24}$ | **M1** | Correct method to find common denominator e.g. $3\dfrac{15}{24}$ and $1\dfrac{16}{24}$ |
| $1\dfrac{23}{24}$ cao | | **A1** | |

Question 308

| 1.25 | | 1 | |
|-----|---|---|---|

**Question 309**

| | | | |
|---|---|---|---|
| 4.6 cao nfww | | 2 | **B1** for 4.57 or 4.58 or 4.579 to 4.580 |
| | | | If 0 scored, **SC1** for their calculation rounded to 2 sf if more than 2sf seen |

**Question 310**

| (a) | Fifteen thousand [and] sixty | 1 | |
|---|---|---|---|
| (b) | $1.506[0] \times 10^4$ | 1 | |

**Question 311**

| | | |
|---|---|---|
| $\dfrac{5}{16} \times \dfrac{8}{7}$ | **M1** | |
| $\dfrac{5}{14}$ cao | **A1** | |

**Question 312**

| | | |
|---|---|---|
| 1.5 | 2 | **M1** for $\dfrac{600 \times r \times 10}{100} = 90$ oe or better |

**Question 313**

| | | |
|---|---|---|
| 229.5225 final answer cao | 2 | **M1** for $(15.1 + 0.05)^2$ or **B1** for 15.15 seen |

**Question 314**

| | | |
|---|---|---|
| 380 | 5 | **B2** for time = 8, implied by 23 on t-axis |
| | | or **M1** for $\dfrac{20}{t} = 2.5$ or $\dfrac{20}{t-15} = 2.5$ or |
| | | $\dfrac{0-20}{t-15} = -2.5$ oe |
| | | **M2** for $\dfrac{1}{2}(their\ 23 + 15) \times 20$ or |
| | | $20 \times 15 + \dfrac{1}{2} \times their\ 8 \times 20$ oe |
| | | or **M1** for any relevant area found |

Question 315

| (a) | 12 | 1 | |
|---|---|---|---|
| (b) | 8 | 1 | |
| (c) | 5 | 1 | |
| (d) | $\sqrt{7}$ | 1 | |

Question 316

| $\dfrac{15}{28} \times \dfrac{7}{4}$ or $\dfrac{15}{28} \div \dfrac{16}{28}$  oe | M1 | |
|---|---|---|
| $\dfrac{15}{16}$  cao | A2 | A1 for $\dfrac{105}{112}$  oe |

Question 317

| 229 500  cao | 3 | **B2** for 229 460… <br> **OR** <br> **M1** for $250\,000 \times \left(1 - \dfrac{1.7}{100}\right)^5$  oe <br><br> **B1** for *their* more accurate answer correctly rounded to the nearest 100 |
|---|---|---|

Question 318

| $2.98 \times 10^{-3}$ | 1 | |
|---|---|---|

Question 319

| $2.\dot{6} - 0.2\dot{6}$  oe | M1 | |
|---|---|---|
| $\dfrac{4}{15}$  oe fraction  nfww | A1 | If **M0** scored **SC1** for $\dfrac{k}{90}$ |

Question 320

| 22.5  nfww | 3 | **M2** for $\dfrac{146.2 + 0.05}{7 - 0.5}$ <br> or **M1** for $146.2 + 0.05$ or $7 - 0.5$ or better seen |
|---|---|---|

Question 321

| (a) | 32 | 1 | |
|---|---|---|---|
| (b) | 36 | 1 | |
| (c) | 37 | 1 | |

**Question 322**

| (a) | 15 09 | 1 | Accept 3 09 pm |
|---|---|---|---|
| (b) | 472 | 2 | **M1** for $80 \times$ *their* time oe<br>or **B1** for time = 5.9 |

**Question 323**

| Correct common denominator | **M1** | |
|---|---|---|
| Correct method | **M1** | e.g. $1\dfrac{3-8}{12}$ or $\dfrac{12+3-8}{12}$ or<br><br>$\dfrac{((3\times4)+1)\times3-((2\times3)+2)\times4}{12}$ or $\dfrac{39-32}{12}$ |
| $\dfrac{7}{12}$ cao | **A1** | |

**Question 324**

| (a) | 0.3 oe | 1 | |
|---|---|---|---|
| (b) | 3060 | 3 | **M2** for $\dfrac{1}{2}(300+210)\times12$ oe<br>or **M1** for one correct part area |

**Question 325**

| 1.22 or 1.219 to 1.22 | 5 | **M1** for SI $= \dfrac{2000\times5\times1.25}{100}$<br><br>**M3** for $\sqrt[5]{\dfrac{2000+their125}{2000}}$<br>or **M2** for $2000k^5 = 2000 + their$ SI<br>or **M1** for CI $= 2000k^5$ |
|---|---|---|

**Question 326**

| −5 | 1 | |
|---|---|---|

**Question 327**

| (a) | Any square number greater than 10 | 1 | |
|---|---|---|---|
| (b) | Any irrational number | 1 | |

**Question 328**

| 0.0625 | 1 | |
|---|---|---|

## Question 329

| | | | |
|---|---|---|---|
| $\dfrac{7}{4}$ | $\dfrac{9}{12}$ | **B1** | |
| $\dfrac{21}{12}$ | $1 - \dfrac{2}{12}$ | **M1** | |
| $\dfrac{5}{6}$ | $\dfrac{5}{6}$ | **A1** | |

## Question 330

| | | |
|---|---|---|
| 8 | 2 | **M1** for $\dfrac{5 - 4.60}{5}\,[\times100]$ or $\dfrac{4.60}{5}\times100$ |

## Question 331

| | |
|---|---|
| 177.5 | 1 |

## Question 332

| | |
|---|---|
| $2.7 \times 10^{-8}$ | 1 |

## Question 333

| | | |
|---|---|---|
| 108 | 3 | **M1** for $(105 + 225) \div 11$ <br> **M1** for *their* speed $\times \dfrac{60\times60}{1000}$ |

## Question 334

| | |
|---|---|
| 15 | 1 |

## Question 335

| | | | |
|---|---|---|---|
| (a) | 52 | 1 | |
| (b) | $7n + 5$  oe  final answer | 2 | **B1** for $7n + a$ or $bn + 5$  $b \neq 0$ |

## Question 336

| | | |
|---|---|---|
| $\dfrac{56}{24} - \dfrac{21}{24}$ | **M2** | **M2** for correct method for common denominator <br> or **B1** for $\dfrac{7}{3}$ |
| *their* $\dfrac{35}{24} \times \dfrac{6}{25}$ | **M1** | |
| $\dfrac{7}{20}$ | **A1** | |

Question 337

| 990 | 3 | **M2** for correct complete area statement <br> e.g. $\frac{1}{2} \times 30 \times (6 + 12) + 60 \times 12$ oe <br> or **M1** for one area calculation |

Question 338

| 34 | 2 | **M1** for $12 + 0.5$ or $4 + 0.5$ or better seen |

Question 339

| $2^5 \times 3^4 \times 13^2$ | 1 | |

Question 340

| 492.2[0] | 3 | **B2** for 32.2[0] <br> OR <br> **M1** for $x \times \left(1 - \dfrac{7}{100}\right) = 427.8[0]$ oe or better <br><br> **M1** for *their* $460 \times \left(1 + \dfrac{7}{100}\right)$ oe <br> or *their* $460 \times \dfrac{7}{100}$ correctly evaluated |

Question 341

| 21 | 2 | **B1** for $3 \times 7$ soi or $2^4 \times 3^2 \times 7^6$ oe <br><br> or answer of $21 \times k^2$ |

Question 342

| $\frac{8}{7}$ and $\frac{21}{10}$ oe improper fractions | M1 | |
| $\frac{168}{70}$ oe improper fractions | A1 | |
| $2\frac{2}{5}$ cao final answer | A1 | **Dep.** on first **A1** <br> If M0 scored **SC1** for $\frac{8}{7}$ or $\frac{21}{10}$ oe <br> improper fractions |

Question 343

| 18.25, 18.35 | 2 | **B1** for each <br> or **SC1** for both values correct but reversed |

Question 344

45.7         | **1** |

Question 345

396         | **1** |

Question 346

80         | **1** |

Question 347

64         | **1** |

Question 348

| 27.15  cao | **3** | **M2** for $(9.4 + 0.05) \times 2 + 8.2 + 0.05$ or better<br>or **M1** for $8.2 + 0.05$ or $9.4 + 0.05$ or better seen<br>OR<br>**SC2** for answer 25.95<br>or **SC1** for answer 26.85 |

Question 349

| 25 | **2** | **M1** for $x \times \left(1 + \dfrac{6}{100}\right) = 26.50$   oe or better |

Question 350

| $2.03 \times 10^{201}$ | **2** | **B1** for figs 203 or $[0].03 \times 10^{201}$ or $200 \times 10^{199}$ |

Question 351

| 15 | **2** | **M1** for 4 [parts] = 20   soi or<br>a correct equation e.g. $\dfrac{x + 20}{7} = \dfrac{x}{3}$   oe |

Question 352

| $\dfrac{5}{6} \times \dfrac{3}{4}$ or $\dfrac{5}{6} \div \dfrac{8}{6}$   oe | **M2** | **M1** for $\dfrac{4}{3}$ seen or for $\dfrac{5}{6} \times their \dfrac{3}{4}$<br>or for $\dfrac{5}{6} \div \dfrac{their\, 8}{6}$ |
| $\dfrac{5}{8}$   cao | **A1** | dep on M2 |

**Question 353**

| 48.72 | 2 | **M1** for $\frac{16}{100} \times 42$  oe or better |
|---|---|---|

**Question 354**

| $7 - (5 - 3) + 4$ | 1 | |
|---|---|---|

**Question 355**

| 200 017 | 1 | |
|---|---|---|

**Question 356**

| $17.77\ldots - 1.77\ldots$  oe | **M1** | **M1** for correct working shown |
|---|---|---|
| $\frac{8}{45}$  cao | **A2** | **B1** for $\frac{16}{90}$  oe seen |

**Question 357**

| 48 700 cao | 3 | **M1** for $45\,000 \times \left(1 + \dfrac{1.6}{100}\right)^{5}$  oe<br><br>**A1** for 48 710 to 48 720<br><br>If A0 scored **B1** for *their* more accurate value correctly rounded to the nearest 100 |
|---|---|---|

**Question 358**

| $40 \times 4$ | 1 | |
|---|---|---|

**Question 359**

| (a) | 0 | 1 | |
|---|---|---|---|
| (b) | $2^2 \times 3 \times 7$ or $2 \times 2 \times 3 \times 7$ | 2 | **B1** for 2, 2, 3, 7 |

**Question 360**

| $\frac{8}{3}$ and $\frac{11}{4}$  oe improper fractions | **M1** | |
|---|---|---|
| $\frac{88}{12}$  oe improper fraction | **A1** | |
| $7 \frac{1}{3}$  cao final answer | **A1** | dep on 1$^{st}$ **A1**<br>If M0 scored **SC1** for $\frac{8}{3}$ or $\frac{11}{4}$  oe improper fraction |

## Question 361

| | | | |
|---|---|---|---|
| $\dfrac{50-10}{4\times2}$ | | **M1** | Allow **M1** for 3 out of 4 values correctly rounded or for all correct but with any trailing zeros |
| 5 | | **A1** | dep on $\dfrac{50-10}{4\times2}$ |

## Question 362

| | | |
|---|---|---|
| 1.75 | 3 | **M2** for $(13.72 - 2.8 \times 2.65) \div 3.6$ oe or **M1** for $2.8 \times 2.65$ |

## Question 363

| | | | |
|---|---|---|---|
| (a) | 245 | 1 | |
| (b) | 69 cao nfww | 3 | **M2** for $\dfrac{200+0.5}{3-0.1}$ oe or **M1** for $200 \pm 0.5$ oe or $3 \pm 0.1$ oe seen |

## Question 364

| | | | |
|---|---|---|---|
| (a) | 1        − 6 | 2 | **B1** for each If 0 scored, **SC1** for two terms with a difference of −7 |
| (b) | $n^2 + 3$ oe | 2 | **M1** for any quadratic or second differences = 2 |

## Question 365

| | | |
|---|---|---|
| 15.8 or 15.76 to 15.77 | 2 | **M1** for $125.9 \times \left(1 - \dfrac{34}{100}\right)^5$ oe |

## Question 366

| | | |
|---|---|---|
| 12 | 2 | **M1** for $2^2 \times 3^2$ and $2^2 \times 3 \times 7$ or for $2\times2\times3$ final answer or **B1** for 2, 3, 4 or 6 as final answer |

## Question 367

| | | |
|---|---|---|
| $4.18 \times 10^7$ cao | 1 | |

## Question 368

| | | |
|---|---|---|
| $\dfrac{37}{99}$ oe fraction | 1 | |

Question 369

| | | |
|---|---|---|
| $\frac{9}{4}$ and $\frac{11}{3}$ oe improper fractions | **M1** | |
| $\frac{99}{12}$ oe improper fraction | **A1** | |
| $8\frac{1}{4}$ cao final answer | **A1** | dep on 1$^{st}$ A1<br>If M0 scored **SC1** for $\frac{9}{4}$ or $\frac{11}{3}$ oe improper fraction |

Question 370

| | | |
|---|---|---|
| 271.2[0] | 2 | **M1** for $56.50 \div 5$ or $56.50 \times 24$ oe or better |

Question 371

| | | |
|---|---|---|
| 3, 80, 30 and 10 seen<br>and answer 12 | 2 | **M1** for 3 out of 4 correct elements<br>or for all correct but with any trailing zeros<br>If 0 scored **SC1** for answer 12 |

Question 372

| | | |
|---|---|---|
| 30<br>48 | 2 | **M1** for $\frac{78}{5+8} \times k$ oe where $k = 1, 5$ or $8$ |

Question 373

| | | |
|---|---|---|
| 70.5 or 70.52 to 70.53 | 4 | **B3** for 59(.0) or 58.99… or 50.5 or 50.47 to 50.48<br>OR<br>**M2** for $\frac{10^2 + 9^2 - 11^2}{2 \times 10 \times 9}$ oe or equivalent expression for smaller angle<br>or **M1** for $11^2 = 10^2 + 9^2 - 2 \times 10 \times 9 \cos(...)$ oe or equivalent expression for smaller angle<br>**A1** for $\frac{1}{3}$ oe |

Question 374

| | | |
|---|---|---|
| $2.31 \times 10^p$ | 2 | **B1** for $21 \times 10^{p-1}$ or $0.21 \times 10^p$ or answer with figs 231 |

Question 375

72  |  **2** | **M1** for $\dfrac{360}{180-175}$ oe or $\dfrac{180(n-2)}{n}=175$ oe

Question 376

477  |  **2** | **M1** for $80-0.5$ oe or better seen

Question 377

$\dfrac{5}{3}\times\dfrac{2}{15}$ oe or  | **M2** | **B1** for $\dfrac{5}{3}$ oe or $\dfrac{15}{2}$ oe

$\dfrac{10}{6}\div\dfrac{45}{6}$ oe with common denominator  | | or **M1** for *their* $\dfrac{5}{3}\times$ *their* $\dfrac{2}{15}$

$\dfrac{2}{9}$ cao  | **A1** |

Question 378

162.07 cao  |  **2** | **M1** for $190\div1.1723$

Question 379

| (a) | 125 | **1** |
|-----|-----|-------|
| (b) | 29  | **1** |

Question 380

$100y-np$  |  **2** | **B1** for $100y$ seen or for answer $[10^k]\,y-np$

Question 381

Question 382

| (a) | $\dfrac{18}{25}$ cao | **1** |
|-----|----------------------|-------|
| (b) | $\dfrac{1}{250}$ cao | **1** |

## Question 383

−24.6 | **1** |

## Question 384

$\dfrac{4}{99}$ cao | **1** |

## Question 385

| (a) | $6.54 \times 10^{-3}$ | **1** |
| --- | --- | --- |
| (b) | 99 | **1** |

## Question 386

| $\dfrac{2}{3} \times \dfrac{7}{10}$ or | **M2** | **B1** for $\dfrac{10}{7}$ oe |
| --- | --- | --- |
| $\dfrac{14}{21} \div \dfrac{30}{21}$ oe with common denominator | | or **M1** for $\dfrac{2}{3} \times their \dfrac{7}{10}$ |
| $\dfrac{7}{15}$ cao | **A1** | |

## Question 387

| (a) | 5<br>97 | **2** | **B1** for each |
| --- | --- | --- | --- |
| (b) | $\sqrt{7}$ | **1** | |

## Question 388

$k - 1$ | **1** |

## Question 389

0.4 or $\dfrac{2}{5}$ | **1** |

Question 390

| 68 nfww | | 3 | M2 for $\dfrac{600-5}{8h40\ to\ 8h50}$ or $\dfrac{590\ to\ 600}{8h40+5[m]}$ oe |
| | | | or M1 for $600-5$ oe or $8h40+5[m]$ oe or $520+5$ oe[m] seen |

Question 391

| 1.8432 | | 2 | M1 for $\dfrac{32\times24000\times24000}{100000\times100000}$ oe |
| | | | If 0 scored, SC1 for figs 184[32]... as answer |

Question 392

| 9080 or 9080.13 | | 2 | M1 for $9500\times\left(1-\dfrac{0.9}{100}\right)^5$ |

Question 393

| $\dfrac{11}{8}\ [-\dfrac{5}{6}]$    $\dfrac{3}{8}+\dfrac{1}{6}$ | B1 | Correct step for dealing with mixed number Allow $\dfrac{11k}{8k}$ |
| $\dfrac{33}{24}$ and $\dfrac{20}{24}$    $\dfrac{9}{24}$ and $\dfrac{4}{24}$ | M1 | Correct method to find common denominator e.g. $1\dfrac{9}{24}$ and $\dfrac{20}{24}$ |
| $\dfrac{13}{24}$  cao | A1 | |

Question 394

| (a) | 4   10   18 | 2 | B1 for 2 correct |
| (b) | $32-7n$ oe final answer | 2 | B1 for $32-kn$ oe $k\neq0$ or $j-7n$ oe or $32-7n$ seen then spoilt |

## Question 395

| (a) | $\begin{pmatrix} 14 \\ -6 \end{pmatrix}$ | 1 | |
| --- | --- | --- | --- |
| (b) | $\begin{pmatrix} -12 \\ 21 \end{pmatrix}$ | 1 | |

## Question 396

| $31 : 21$ | | 3 | **B2** for equivalents e.g. 15.5 oe and 10.5 oe or for an equivalent ratio e.g. 3.1 : 2.1 |
| --- | --- | --- | --- |
| | | | or **M1** for e.g. $x + 5 + x = 26$ oe or $x - 5 + x = 26$ oe |

## Question 397

| 145 | | 2 | **M1** for $x\left(1 + \dfrac{6}{100}\right) = 153.7$ oe or better |
| --- | --- | --- | --- |

## Question 398

| $1[.0] \times 10^{-2}$ cao | | 2 | **B1** for 0.01 oe |
| --- | --- | --- | --- |

## Question 399

| $\dfrac{11}{12} + \dfrac{9}{12}$ oe | **M1** | Allow any correct common denominator $12k$ |
| --- | --- | --- |
| $1\dfrac{2}{3}$ cao | **A2** | **A1** for $\dfrac{20}{12}$ or equivalent improper fraction or mixed number |

## Question 400

| (a) | $-13$ | 1 | |
| --- | --- | --- | --- |
| (b) | $-4n + 7$ oe final answer | 2 | **B1** for $-4n + k$ or $jn + 7$ $(j \neq 0)$ or for a correct answer spoilt |

Question 401

$\dfrac{3}{11}$ oe fraction $\qquad$ **1**

Question 402

4.32 $\qquad$ **3** **B1** for $\dfrac{1}{4}$ oe or $\dfrac{2}{4.5}$ oe seen

**M1 dep** on **B1** for $\dfrac{1+2}{their\,\frac{1}{4}+their\,\frac{2}{4.5}}$ oe

Question 403

357 $\qquad$ **2** **M1** for $\left(1-\dfrac{15}{100}\right)\times 420$ oe

or **B1** for 63

Question 404

170 $\qquad$ **1**

Question 405

| (a) | $\neq$ and $>$ indicated | 1 |
|-----|--------------------------|---|
| (b) | $7-(3-1)+2=7$ cao | 1 |

Question 406

13 $\qquad$ **1**

Question 407

12.5 $\qquad$ **1**

**Question 408**

| | | |
|---|---|---|
| $13 - 5n$ oe final answer | **5** | **B2** for $13 - 5n$ oe final answer<br>or **B1** for $-5n + c$ or $13 - kn$ $k \neq 0$<br>or $13 - 5n$ seen then spoilt |
| $\dfrac{n+1}{n}$ oe final answer | | **B1** for $\dfrac{n+1}{n}$ oe final answer |
| $2^{n-2}$ oe final answer | | **B2** for $2^{n-2}$ oe final answer<br>or **B1** for $2^{n-k}$ oe $k$ can be 0 |

**Question 409**

| | | |
|---|---|---|
| 15 | **2** | **M1** for $360 \div (180 - 156)$ or<br>$\dfrac{180(n-2)}{n} = 156$ oe |

**Question 410**

| | | |
|---|---|---|
| $\dfrac{24}{1000} < 2.1 \times 10^{-1} < 22\% < 0.\dot{2} < \sqrt{0.2}$ | **2** | **M1** for four values in the correct order<br><br>or for conversion to consistent comparable<br>form e.g. 0.21, 0.22…, 0.22, 0.4.., 0.024 |

**Question 411**

| | | |
|---|---|---|
| 2.5 oe | **1** | |

**Question 412**

| | | |
|---|---|---|
| $\dfrac{1}{3} \times \dfrac{6}{7}$ oe or $\dfrac{2}{6} \div \dfrac{7}{6}$ oe | **M1** | |
| $\dfrac{2}{7}$ oe | **A1** | |
| *their* $\dfrac{2}{7} + \dfrac{1}{5}$ with a correct method to find fractions with a common denominator | **M1** | e.g. $\dfrac{10}{35} + \dfrac{7}{35}$ oe |
| $\dfrac{17}{35}$ cao | **A1** | If order of operations not correct **SC2** for answer $\dfrac{10}{41}$ with correct working for $\dfrac{1}{3} \div \left( \dfrac{7}{6} + \dfrac{1}{5} \right)$<br><br>or **SC1** for $\dfrac{35}{30} + \dfrac{6}{30}$ oe |

Question 413

| 12 | | 3 | **M2** for $(95.25 - 15.5) \div 7.25$  oe<br>or $(95.25 - (15.5 - 7.25)) \div 7.25$  oe<br><br>or **M1** for $95.25 - 15.5$<br>or **B1** for $79.75$ |

Question 414

| 129 | | 1 | |

Question 415

| 7.5 | | 1 | |

Question 416

| (a) | $n^3 + 7$ oe final answer | | 2 | **B1** for any cubic or for 3rd differences of 6 |
| (b) | $\dfrac{n+1}{4^{n-1}}$ oe final answer | | 3 | **B1** for $n + 1$<br><br>**B2** for $4^{n-1}$ oe<br><br>or **B1** for $4^{n-k}$ oe $k$ can be 0<br><br>Maximum 2 marks if not correctly combined as a fraction |

Question 417

| 3 : 5 nfww | | 4 | **M3** for $5^2 - 1$ oe and $8^2 - 5^2 + 1$ oe<br><br>or **M2** for $5^2 - 1$ oe or $8^2 - 5^2 + 1$ oe<br><br>or **M1** for $5^2$ oe or $8^2$ oe seen |

**Question 418**

$[-] 9$       **3**   **M2** for $[k \times] \left(1 - \dfrac{35}{100}\right) \times \left(1 + \dfrac{40}{100}\right)$ oe or better

or for $[k \times] \left(\dfrac{35}{100} - \left(1 - \dfrac{35}{100}\right) \times \dfrac{40}{100}\right)$

or **M1** for $[k \times] \left(1 - \dfrac{35}{100}\right)$ oe

or $[k \times] \left(1 + \dfrac{40}{100}\right)$ or better

**Question 419**

$60$       **2**   **M1** for $360 \div (180 - 174)$

or for $\dfrac{180(n-2)}{n} = 174$ oe

**Question 420**

$\dfrac{25 \text{ or } 55}{30}$ and $\dfrac{12}{30}$     **M1**   Accept $\dfrac{25k \text{ or } 55k}{30k}$ and $\dfrac{12k}{30k}$

$2\dfrac{7}{30}$ cao     **A2**   **A1** for $\dfrac{67k}{30k}$ or $1\dfrac{37k}{30k}$

**Question 421**

$3.1$       **1**

Question 422

| (a) | Sunday 24 [July] 02 15 | | 3 | **B1** for Sunday 24th [July] as final answer<br>**B2** for 02 15 oe as final answer<br><br>or **B1** for sight of any of these 12 40 oe, 11 15 oe, 28h 35min, 50 15, 35 15<br><br>or 0215 oe spoilt<br><br>or **M1** for departure time + 13h35min + 15h evaluated as a time with one interval correctly added |
| --- | --- | --- | --- | --- |
| (b) | 6320.4[0] | | 1 | |

Question 423

| 79 | | 2 | **B1** for 64 or 81 seen or for answer 61, 62, 67, 71 or 73 |
| --- | --- | --- | --- |

Question 424

| $\dfrac{7}{3}$ oe improper fraction | **M1** | or $\dfrac{k}{3} \times \dfrac{11}{14}$ where $k > 3$ |
| --- | --- | --- |
| $1\dfrac{5}{6}$ cao | **A2** | **A1** for $\dfrac{77}{42}$ or $\dfrac{11}{6}$ or $1\dfrac{35}{42}$ |

Question 425

| (a) | 805 | | 3 | **B2** for 105<br><br>or **M2** for $\dfrac{700 \times 2.5 \times 6}{100} + 700$ oe<br><br>or **M1** for $\dfrac{700 \times 2.5 [\times 6]}{100}$ oe |
| --- | --- | --- | --- | --- |
| (b) | 2.3[0...] | | 3 | **M2** for $\sqrt[17]{\dfrac{1030.35}{700}}$ oe<br><br>or **M1** for $1030.35 = 700(k)^{17}$ oe for any $k$ |

Question 426

| | | | |
|---|---|---|---|
| (a) | 8   11   16 | 2 | **B1** for two correct |
| (b) | 23 – 8*n* oe final answer | 2 | **B1** for *j* – 8*n* or 23 – *kn* *k* ≠ 0 or 23 – 8*n* seen then spoilt |

Question 427

| | | |
|---|---|---|
| 7 [h] 18 [min] | 1 | |

Question 428

| | | |
|---|---|---|
| 80.50 cao | 2 | **B1** for 80.498… or 80.5 or correctly rounding their more accurate decimal to 2 dp |

Question 429

| | | |
|---|---|---|
| 13.75 14.85 | 3 | **B2** for one correct answer or both correct answers seen in working then rounded to 3sf or both correct but reversed |
| | | or **M1** for 2 correct seen from 23 + 0.5, 23 – 0.5, 8.7 + 0.05 or 8.7 – 0.05 or better |

Question 430

| | | |
|---|---|---|
| $3n^2 + 5$ oe final answer | 2 | **M1** for correctly finding second differences or an answer that is a quadratic sequence |

Question 431

| | | |
|---|---|---|
| 0.14 oe nfww | 4 | **M3** for $\dfrac{14}{50 \times 2}$ with at least 2 out of 3 values correct and for the **one** incorrect value: *f* must be 1, 2 or 7 *m* must be a multiple of 50 *p* must be prime OR **B1** for *f* = 14 **B1** for *m* = 50 **B1** for *p* = 2 If **0** scored **SC1** for a correct multiple for *m*, factor for *f* or prime for *p* |

**Question 432**

18        2   **M1** for $\dfrac{300\times60}{1000}$ oe

or **B1** for figs 18 in *their* answer

**Question 433**

| | | |
|---|---|---|
| $\dfrac{2}{9}\times\dfrac{6}{5}$   or   $\dfrac{4}{18}\div\dfrac{15}{18}$   oe | **M1** | |
| $\dfrac{4}{15}$   cao | **A1** | |

**Question 434**

0, 3, 8      2   **B1** for 2 correct terms in correct position
or **SC1** for −1, 0, 3

**Question 435**

$4a^2b$ final answer      2   **M1** for two correct parts out of three from 4, $a^2$ and $b$ in final answer

**Question 436**

2.6[0] or 2.600…      3   **M2** for $\sqrt[10]{\dfrac{1328.54+4540}{4540}}$

or **M1** for $4540\times k^{10}=1328.54+4540$ for any $k$

If 0 scored **SC1** for answer −11.6 or −11.56…

**Question 437**

| | | |
|---|---|---|
| $\dfrac{33}{8}$ or $\dfrac{17}{6}$     $2\dfrac{1}{8}-\dfrac{5}{6}$ | **B1** | Correct step for dealing with mixed numbers <br> Allow $\dfrac{33k}{8k}$ or $\dfrac{17k}{6k}$ |
| $\dfrac{99}{24}$ and $\dfrac{68}{24}$     $[2]\dfrac{3}{24}-\dfrac{20}{24}$ | **M1** | Correct method to find common denominator <br> e.g. $4\dfrac{3}{24}$ and $2\dfrac{20}{24}$ |
| $1\dfrac{7}{24}$ cao and correct working | **A1** | |

**Question 438**

13  16  21 | 2 | **B1** for 2 correct terms in correct position or **SC1** for 12, 13, 16

**Question 439**

103.32 cao | 2 | **M1** for $126 \times \left(1 - \dfrac{18}{100}\right)$ oe

or **B1** for 22.68

**Question 440**

102 | 1 |

**Question 441**

11  27 | 3 | **M1** for $500 \div 43$ oe

**M1** for $500 - their\,11 \times 43$ oe
*their* 11 must be an integer from 2 to 11

**Question 442**

13 or $-13$ | 1 |

**Question 443**

90 | 3 | **B2** for 210 or 0.09 km
OR

**M1** for speed $\times$ time seen

**M1** for correct conversion of both km to m and between h and s

**Question 444**

$1.98 \times 10^{100}$ | 2 | **B1** for $200 \times 10^{98}$ or $0.02 \times 10^{100}$ or answer with figs 198

**Question 445**

(a) | $-3$ | 1 |

(b) | $27 - 5n$ oe final answer | 2 | **B1** for $j - 5n$ or $27 - kn$, $k \neq 0$ or for $27 - 5n$ seen then spoilt

## Question 446

| | | |
|---|---|---|
| $\frac{9}{21}$ and $\frac{2}{21}$ oe | **M1** | Allow any correct denominator 21k |
| $\frac{1}{3}$ cao and correct working | **A1** | |

## Question 447

| | | |
|---|---|---|
| $2 \times 2 \times 3 \times 3 \times 5$ oe | **2** | **B1** for 2, 2, 3, 3, 5 <br> or **M1** for correct factor tree/diagram/table. |

## Question 448

| | | |
|---|---|---|
| 320 | **2** | **M1** for $380.8 \div 1.19$ oe |

## Question 449

| | | |
|---|---|---|
| 399 | **1** | |
| 4.286 cao | **2** | **B1** for 4.285[7...] or 4.29 or $\frac{30}{7}$ or $4\frac{2}{7}$ <br><br> or for correctly rounding their more accurate decimal to 4sf |

## Question 450

| | | |
|---|---|---|
| 2h 57 min | **1** | |

## Question 451

| | | |
|---|---|---|
| 399 | **1** | |

## Question 452

| | | |
|---|---|---|
| 31 or 37 | **1** | |

## Question 453

| | | |
|---|---|---|
| 49.6 | **2** | **M1** for answer figs 496 |

## Question 454

| | | |
|---|---|---|
| $2.\dot{4} - 0.2\dot{4}$ oe | **M1** | |
| $\frac{11}{45}$ cao | **B1** | If **0** scored **SC1** for $\frac{k}{90}$. |

**Question 455**

| 320.18 | 3 | **B2** for 4320.18 |
| | | or **M1** for $4000 \times \left(1+\dfrac{2.6}{100}\right)^3 \ [-4000]$ oe |

**Question 456**

| 180 | 2 | **M1** for answer $2 \times 2 \times 3 \times 3 \times 5$ or better or for answer $180k$ |
| | | or two correct factor trees, tables or Venn diagram or better |
| | | or a list of multiples of both 36 and 60 with at least 3 correct of each |

**Question 457**

| $\dfrac{15}{21}$ and $\dfrac{14}{21}$ oe | **M1** | Allow any correct common denominator $21k$ |
| $\dfrac{1}{21}$ cao | **A1** | |

**Question 458**

| 93  95  101  101 | 3 | **M1** for $4 \times 97.5$ implied by 390 or for four numbers which add to 390 |
| | | **B1** for four numbers with a range of 8 |
| | | **B1** for four numbers with mode of 101 |
| | | to a maximum of 2 marks |

**Question 459**

| 6.05 or 6.054 to 6.055 | **1** | |

**Question 460**

| (a) | 121 | **1** | |
| (b) | 216 | **1** | |

**Question 461**

| 5[h] 23[min] | **1** | |

## Question 462

| | | |
|---|---|---|
| $419.\dot{1}\dot{9} - 4.\dot{1}\dot{9}$ oe | **M1** | |
| $\dfrac{83}{198}$ cao | **A2** | **A1** for $\dfrac{415}{990}$ oe <br><br> If M0 scored **SC1** for $\dfrac{k}{990}$ or correct answer with insufficient working |

## Question 463

| | | |
|---|---|---|
| $5 \times 199^{57}$ | **2** | **M1** for $[315 =] 3^2 \times 5 \times 7$ oe <br><br> or $3^2 \times 5^2 \times 7 \div 315 = 5$ |

## Question 464

| | | | |
|---|---|---|---|
| (a) | 3456 | **1** | |
| (b) | 0.75 or $\dfrac{3}{4}$ oe | **1** | |
| (c) | 0.25 or $\dfrac{1}{4}$ | **1** | |

## Question 465

| | | |
|---|---|---|
| $\dfrac{10}{18}$ and $\dfrac{3}{18}$ | **M1** | Allow any correct common denominator $18k$ |
| $\dfrac{7}{18}$ cao | **A1** | |

## Question 466

| | | | |
|---|---|---|---|
| (a) | 2   −9 | **2** | **B1** for one correct |
| (b) | Sequence A <br> $7n - 4$ oe final answer | **2** | **B1** for $7n + c$ or $kn - 4$ $k \neq 0$ <br> or for correct answer seen then spoilt |
| | Sequence B <br> $3n^2 - 1$ oe final answer | **2** | **M1** for finding second differences of 6 <br><br> or has an answer that is a quadratic sequence <br><br> or for correct answer seen then spoilt |

**Question 467**

6.55      **3** | **M2** for $(33.48 - 2.4 \times 0.85)$ oe

or **M1** for $2.4 \times 0.85$

**Question 468**

0      **1**

**Question 469**

4   nfww      **2** | **M1** for $39 + 0.5$ or $36 - 0.5$ or better seen
$39 - 0.5$ or $36 + 0.5$

**Question 470**

$\dfrac{2}{6} + \dfrac{5}{6}$   oe      **M1** | i.e. correct fractions with common denominator $6k$

$1\dfrac{1}{6}$   cao      **A1**

**Question 471**

(a) | 243      **1**

(b) | $4n + 9$   oe final answer      **2** | **B1** for $4n + k$ or $jn + 9, j \neq 0$
or for correct answer seen then spoilt

**Question 472**

442      **2** | **M1** for $\dfrac{100 - 15}{100} \times 520$ oe

or **B1** for 78

**Question 473**

140, 60      **2** | **M1** for $\dfrac{200}{(7 + 3)} \times k$ where $k = 1, 7$ or 3

**Question 474**

$\dfrac{4}{25}$   cao      **2** | **M1** for $\dfrac{32}{200}$ oe

**Question 475**

7 h 10 min      **1**

**Question 476**

Any multiple of 72      **1**

**Question 477**

| 1.08 | 3 | **M2** for $\dfrac{13\,\text{to}\,14}{12+0.5}$ oe or $\dfrac{14-0.5}{12\,\text{to}\,13}$ oe <br> or **M1** for $14+0.5$ oe or $14-0.5$ oe <br> or $12+0.5$ oe or $12-0.5$ oe |
|---|---|---|

**Question 478**

| (a) | $(n-1)^3 - 1$ oe | 2 | **M1** for any cubic or third differences $= 6$ |
|---|---|---|---|
| (b) | $24 \times \left(\dfrac{1}{2}\right)^{n-1}$ oe | 2 | **M1** for $c \times \left(\dfrac{1}{2}\right)^{an+b}$ oe where $a$, $b$ and $c$ are constants and $a > 0$ |

**Question 479**

| $4x^{12}$ final answer | 2 | **B1** for $4x^k$ or $kx^{12}$ or for $4x^{12}$ seen then spoiled |
|---|---|---|

**Question 480**

| $9 \times 10^{-2}$ | 2 | **B1** for $0.09$ oe <br> or **M1** for *their* decimal correctly converted to standard form if negative power |
|---|---|---|

**Question 481**

| $\dfrac{4}{7} \times \dfrac{1}{8}$ oe or $\dfrac{4}{7} \div \dfrac{56}{7}$ oe | M1 | |
|---|---|---|
| $\dfrac{1}{14}$ cao | A1 | |

**Question 482**

| (a) | $-1$ | 1 | |
|---|---|---|---|
| (b) | $29 - 6n$ oe final answer | 2 | **B1** for $k - 6n$ or $29 - kn$ or $29 - 6n$ seen then spoiled |

**Question 483**

| (a) | 27 | 1 | |
|---|---|---|---|
| (b) | 29 | 1 | |

**Question 485**

| 1h 48 min nfww | 4 | **B3** for 1.8 [hrs], $1\frac{4}{5}$ [hrs], $\frac{9}{5}$ [hrs] or 108 [mins] nfww<br><br>or **M2** for $\frac{220 \text{ to } 221}{125 - 2.5}$ or $\frac{220 + 0.5}{120 \text{ to } 125}$<br><br>or **M1** for $220 + 0.5$ or $220 - 0.5$ or $125 + 2.5$ or $125 - 2.5$ |

**Question 486**

| 807 | 2 | **M1** for $980 \times \left(1 - \dfrac{1.75}{100}\right)^{11}$ oe or better |

**Question 487**

| $581.81... - 5.81...$ oe | **M1** | |
| $\dfrac{32}{55}$ cao | **A2** | **A1** for $\dfrac{576}{990}$ oe<br><br>If **M0** scored **SC1** for $\dfrac{k}{990}$ or for answer $\dfrac{32}{55}$ with insufficient working. |

**Question 488**

| 8.03 or 8.032 to 8.033 | 1 | |

**Question 489**

| $\dfrac{k}{12} + \dfrac{27}{12}$ or $\dfrac{71}{12} + \dfrac{c}{12}$ oe   [5] $\dfrac{11}{12}$ and [2] $\dfrac{3}{12}$ oe | **M1** | Accept with other correct common denominators<br><br>e.g. 24, 36, 48 such as $\dfrac{71f}{12f}$ and $\dfrac{27f}{12f}$ |
| $8\dfrac{1}{6}$ cao | **A2** | **A1** for fraction equivalent to $8\dfrac{1}{6}$<br><br>e.g. $\dfrac{49k}{6k}$ or $8\dfrac{1k}{6k}$ or $7\dfrac{7}{6}$ |

**Question 490**

52 | | **2** | **M1** for $12 = x \times \dfrac{3}{13}$ oe or better e.g. $12 \div \dfrac{3}{13}$ oe

**Question 491**

20 15 or [0]8.15pm | | **1** |

**Question 492**

$621.21\ldots - 6.21\ldots$ oe | **M1** |

$\dfrac{41}{66}$ cao | **A2** | **A1** for $\dfrac{615}{990}$ oe

If M0 scored **SC1** for $\dfrac{k}{990}$ or for answer $\dfrac{41}{66}$ with insufficient working

**Question 493**

$\dfrac{4}{7} \times \dfrac{21}{26}$ oe

or

$\dfrac{12}{21} \div \dfrac{26}{21}$ oe with common denominator | **M2** | **B1** for $\dfrac{26}{21}$ or $\dfrac{21}{26}$ oe

or **M1** for $\dfrac{4}{7} \times \dfrac{21}{their\,26}$ oe

$\dfrac{6}{13}$ cao | **A1** |

**Question 494**

8.75 | | **2** | **M1** for $\dfrac{3.5 \times 250000}{100 \times 1000}$ oe

or **B1** for figs 875 or 1 cm : 2.5 km

**Question 495**

108 | | **2** | **B1** for 47 or 61 identified

**Question 496**

−13 | | **1** |

**Question 497**

1.24[0…] | | **3** | **M2** $\sqrt[8]{\dfrac{6000+621.70}{6000}}$ oe

or **M1** for $6000 + 621.70 = 6000(k)^8$ oe

**Question 498**

$\dfrac{15}{7} \times \dfrac{9}{5}$ oe

or $\dfrac{135}{63} \div \dfrac{35}{63}$ oe with common denominator

| **M2** | **B1** for $\dfrac{15}{7}$ oe |
|---|---|
| | or **M1** for $\dfrac{their\,15}{7} \times \dfrac{9}{5}$ oe |

$3\dfrac{6}{7}$ cao

**A1**

**Question 499**

| (a) | 9 6 1 | 2 | **B1** for 2 correct |
|---|---|---|---|
| (b) | $3n + 4$ oe final answer | 2 | **B1** for $3n + j$ or $kn + 4$ $k \neq 0$, or $3n + 4$ seen then spoilt |

**Question 500**

| 11.75 | 2 | **M1** for $\dfrac{9.4 \times 125000}{100 \times 1000}$ oe |
|---|---|---|
| | | or **B1** for figs 1175 or 1 cm : 1.25 km |

**Question 501**

$\dfrac{7 \times 2}{20 - 6}$

**M1**

| 1 nfww | **A1** | If 0 scored **SC1** for 3 correct roundings or for all correct but with any trailing zeros |
|---|---|---|

**Question 502**

| 06 15 or 6:15 am | 1 |
|---|---|