

# Speed, density and pressure

Foundation and Higher tiers | Total marks: 127

## Marks

- M** Method mark, for a correct method. It can be implied by a correct answer.
- A** Accuracy mark, for a correct answer. It needs the method mark before it.
- B** A mark for a correct value or statement, with or without working.
- ft** Follow through: the mark is given for using an earlier wrong answer correctly.
- oe** Or equivalent.
- [a, b]** Any value from a to b inclusive.

## Questions

| Q  | Skill                                  | Spec    | Tier       | Grade | Calculator | Marks |
|----|----------------------------------------|---------|------------|-------|------------|-------|
| 1  | Average speed                          | R11     | Foundation | 2     | No         | 2     |
| 2  | Unit pricing: best buy                 | R11     | Foundation | 3     | No         | 3     |
| 3  | Speed: spot the error                  | R11     | Foundation | 4     | No         | 3     |
| 4  | Rates: filling at two rates            | R11     | Foundation | 4     | No         | 3     |
| 5  | Density: find the mass                 | R11     | Common     | 4     | No         | 3     |
| 6  | Pressure: a decision                   | R11     | Common     | 6     | No         | 3     |
| 7  | Speed: catching up                     | R11     | Foundation | 6     | No         | 4     |
| 8  | Pressure: changing the face            | R11     | Common     | 6     | No         | 3     |
| 9  | Average speed there and back           | R11     | Foundation | 7     | No         | 3     |
| 10 | Density: find the mixing ratio         | R11 A21 | Common     | 7     | No         | 4     |
| 11 | Speed: a moving walkway                | R11     | Foundation | 7     | No         | 3     |
| 12 | Rates of pay                           | R11     | Foundation | 3     | Yes        | 3     |
| 13 | Speed: distance with a change of units | R11 N13 | Foundation | 3     | Yes        | 3     |
| 14 | Speed: find the time                   | R11 N13 | Foundation | 4     | Yes        | 3     |
| 15 | Density: how many can be made          | R11     | Common     | 4     | Yes        | 3     |
| 16 | Rates: cost of fuel                    | R11     | Foundation | 4     | Yes        | 3     |

| Q  | Skill                              | Spec       | Tier       | Grade | Calculator | Marks      |
|----|------------------------------------|------------|------------|-------|------------|------------|
| 17 | Comparing average speeds           | R11 N13    | Foundation | 4     | Yes        | 3          |
| 18 | Rates of pay: a comparison         | R11        | Foundation | 4     | Yes        | 3          |
| 19 | Rates: time in minutes and seconds | R11        | Foundation | 4     | Yes        | 3          |
| 20 | Density: a decision                | R11        | Common     | 5     | Yes        | 3          |
| 21 | Average speed for a whole journey  | R11        | Foundation | 5     | Yes        | 4          |
| 22 | Pressure: is it safe               | R11        | Common     | 5     | Yes        | 4          |
| 23 | Speed: converting units to compare | R11 R1     | Common     | 5     | Yes        | 3          |
| 24 | Density: find a length             | R11 G16    | Common     | 5     | Yes        | 3          |
| 25 | Pressure: find the area            | R11 R1     | Common     | 6     | Yes        | 3          |
| 26 | Density of a mixture               | R11        | Common     | 6     | Yes        | 4          |
| 27 | Rates: filling a cylinder          | R11 G16 R1 | Foundation | 6     | Yes        | 4          |
| 28 | Rates: rainfall into a tank        | R11 R1 G16 | Foundation | 6     | Yes        | 4          |
| 29 | Speed: the rest of a journey       | R11        | Foundation | 6     | Yes        | 4          |
| 30 | Density in a multi-step problem    | R11 G16    | Common     | 7     | Yes        | 5          |
| 31 | Density of an alloy                | R11 R5     | Common     | 7     | Yes        | 4          |
| 32 | Density: melting and recasting     | R11 G17    | Common     | 7     | Yes        | 5          |
| 33 | Rates: flow through a pipe         | R11 R1 G16 | Common     | 7     | Yes        | 4          |
| 34 | Pressure under a cylinder          | R11 G16    | Common     | 7     | Yes        | 5          |
| 35 | Speed and upper bounds             | R11 N16    | Higher     | 8     | Yes        | 4          |
| 36 | Speed: overtaking                  | R11 R1     | Common     | 8     | Yes        | 6          |
|    | <b>Total</b>                       |            |            |       |            | <b>127</b> |

**Question 1** R11 · Foundation · Grade 2 · 2 marks

| Q | Answer         | Mark | Comments                          |
|---|----------------|------|-----------------------------------|
| 1 | $150 \div 2.5$ | M1   | oe, or 30 miles in each half hour |
|   | 60             | A1   |                                   |

**Question 2** R11 · Foundation · Grade 3 · 3 marks

| Q | Answer                          | Mark | Comments                                                          |
|---|---------------------------------|------|-------------------------------------------------------------------|
| 2 | $4.20 \div 1.5$ or 2.80         | M1   | oe, a cost for one size per litre, or litres per £1               |
|   | $6.75 \div 2.5$ or 2.70         | M1   | oe, the same for the other size; or 7.5 litres for £21 and £20.25 |
|   | <b>Large with 2.70 and 2.80</b> | A1   | or with correct values for another method                         |

**Question 3** R11 · Foundation · Grade 4 · 3 marks

| Q    | Answer                                                                                     | Mark | Comments |
|------|--------------------------------------------------------------------------------------------|------|----------|
| 3(a) | <b>1 minute 20 seconds is not 1.2 (minutes), or he has not changed the time to seconds</b> | B1   | oe       |
| 3(b) | 1 minute 20 seconds = 80 seconds or $400 \div 80$                                          | M1   |          |
|      | 5                                                                                          | A1   |          |

**Question 4** R11 · Foundation · Grade 4 · 3 marks

| Q | Answer                      | Mark | Comments          |
|---|-----------------------------|------|-------------------|
| 4 | $12 + 8$ or 20              | M1   | litres per minute |
|   | $150 \div 20$ or 7.5        | M1   |                   |
|   | <b>7 minutes 30 seconds</b> | A1   |                   |

**Question 5** R11 · Common · Grade 4 · 3 marks

| Q | Answer                          | Mark | Comments   |
|---|---------------------------------|------|------------|
| 5 | $20 \times 10 \times 6$ or 1200 | M1   | the volume |
|   | $0.75 \times 1200$              | M1   | oe         |
|   | 900                             | A1   |            |

### Question 6 R11 · Common · Grade 6 · 3 marks

| Q | Answer                      | Mark | Comments          |
|---|-----------------------------|------|-------------------|
| 6 | $0.4 \times 0.2$ or 0.08    | M1   | the smallest face |
|   | $120 \div$ their 0.08       | M1   | oe                |
|   | <b>1500 N/m<sup>2</sup></b> | A1   | units needed      |

### Question 7 R11 · Foundation · Grade 6 · 4 marks

| Q | Answer                                   | Mark | Comments                                  |
|---|------------------------------------------|------|-------------------------------------------|
| 7 | $48 \times \frac{15}{60}$ or 12          | M1   | the distance car A has gone by 09:15      |
|   | $64 - 48$ or 16                          | M1   | oe, how much faster B is                  |
|   | $12 \div 16$ or 0.75 hours or 45 minutes | M1   | oe, or a table of distances for both cars |
|   | <b>10:00</b>                             | A1   |                                           |

### Question 8 R11 · Common · Grade 6 · 3 marks

| Q | Answer                   | Mark | Comments                                                                                 |
|---|--------------------------|------|------------------------------------------------------------------------------------------|
| 8 | $0.4 \times 0.25$ or 0.1 | M1   | oe, the largest face in m <sup>2</sup> ; or 1000 cm <sup>2</sup> and 250 cm <sup>2</sup> |
|   | $600 \times 0.1$ or 60 N | M1   | oe, the force; or $1000 \div 250 = 4$                                                    |
|   | <b>2400</b>              | A1   |                                                                                          |

### Question 9 R11 · Foundation · Grade 7 · 3 marks

| Q | Answer                                                                  | Mark | Comments                                             |
|---|-------------------------------------------------------------------------|------|------------------------------------------------------|
| 9 | a distance chosen and both times found, e.g. 36 km: 2 hours and 3 hours | M1   | oe, or $\frac{d}{18} + \frac{d}{12} = \frac{5d}{36}$ |
|   | $72 \div 5$                                                             | M1   | oe, the total distance $\div$ the total time         |
|   | <b>14.4 from full working</b>                                           | A1   |                                                      |

### Question 10 R11 A21 · Common · Grade 7 · 4 marks

| Q  | Answer                      | Mark | Comments                                                                                                 |
|----|-----------------------------|------|----------------------------------------------------------------------------------------------------------|
| 10 | $0.8p + 1.2q$               | M1   | oe, the total mass for volumes $p$ and $q$                                                               |
|    | $0.8p + 1.2q = 0.95(p + q)$ | M1   | oe                                                                                                       |
|    | $0.25q = 0.15p$             | M1   | oe, or a correct trial such as 5 cm <sup>3</sup> and 3 cm <sup>3</sup> giving 7.6 g in 8 cm <sup>3</sup> |
|    | <b>5 : 3</b>                | A1   |                                                                                                          |

**Question 11** R11 · Foundation · Grade 7 · 3 marks

| Q         | Answer                                                      | Mark      | Comments                                            |
|-----------|-------------------------------------------------------------|-----------|-----------------------------------------------------|
| <b>11</b> | $\frac{1}{90}$ and $\frac{1}{36}$ of the length each second | <b>M1</b> | oe, or a length chosen, e.g. 180 m: 2 m/s and 5 m/s |
|           | $\frac{1}{36} - \frac{1}{90} = \frac{1}{60}$                | <b>M1</b> | oe, e.g. $5 - 2 = 3$ m/s                            |
|           | <b>60</b>                                                   | <b>A1</b> |                                                     |

**Question 12** R11 · Foundation · Grade 3 · 3 marks

| Q         | Answer                                | Mark      | Comments |
|-----------|---------------------------------------|-----------|----------|
| <b>12</b> | $35 \times 11.44$ or 400.40           | <b>M1</b> |          |
|           | $6 \times 11.44 \times 1.5$ or 102.96 | <b>M1</b> | oe       |
|           | <b>£503.36</b>                        | <b>A1</b> |          |

**Question 13** R11 N13 · Foundation · Grade 3 · 3 marks

| Q         | Answer                    | Mark      | Comments                                                         |
|-----------|---------------------------|-----------|------------------------------------------------------------------|
| <b>13</b> | $4 \times 60 + 15$ or 255 | <b>M1</b> | the time in seconds, or $5.6 \times 60$ or 336 with 4.25 minutes |
|           | $5.6 \times 255$ or 1428  | <b>M1</b> | oe, ft their time in seconds                                     |
|           | <b>1.428</b>              | <b>A1</b> | M1 M1 A0 for 1428 m                                              |

**Question 14** R11 N13 · Foundation · Grade 4 · 3 marks

| Q         | Answer                                          | Mark      | Comments              |
|-----------|-------------------------------------------------|-----------|-----------------------|
| <b>14</b> | $38 \div 24$ or 1.58...                         | <b>M1</b> | oe, the time in hours |
|           | $0.58... \times 60$ or 35 minutes or 95 minutes | <b>M1</b> | oe                    |
|           | <b>12:25</b>                                    | <b>A1</b> | accept 12:25 pm       |

**Question 15** R11 · Common · Grade 4 · 3 marks

| Q         | Answer                            | Mark      | Comments                                                                       |
|-----------|-----------------------------------|-----------|--------------------------------------------------------------------------------|
| <b>15</b> | $50 \div 10.49$ or 4.766...       | <b>M1</b> | oe, the volume of the bar; or $0.62 \times 10.49$ or 6.50... g for one pendant |
|           | their $4.77 \div 0.62$ or 7.69... | <b>M1</b> | oe, or $50 \div$ their 6.50                                                    |
|           | <b>7</b>                          | <b>A1</b> |                                                                                |

**Question 16** R11 · Foundation · Grade 4 · 3 marks

| Q         | Answer                                      | Mark      | Comments            |
|-----------|---------------------------------------------|-----------|---------------------|
| <b>16</b> | $275 \div 100 \times 6.4$ or 17.6           | <b>M1</b> | oe, the litres used |
|           | their $17.6 \times 142.9$ or $\times 1.429$ | <b>M1</b> | oe                  |
|           | <b>£25.15</b>                               | <b>A1</b> | or 2515p            |

**Question 17** R11 N13 · Foundation · Grade 4 · 3 marks

| Q         | Answer                             | Mark      | Comments                                   |
|-----------|------------------------------------|-----------|--------------------------------------------|
| <b>17</b> | $7.8 \div 13 \times 60$ or 36      | <b>M1</b> | oe, or 0.6 km per minute                   |
|           | $9.5 \div 16 \times 60$ or 35.6... | <b>M1</b> | oe, or 0.59... km per minute               |
|           | <b>Drone A with 36 and 35.6</b>    | <b>A1</b> | or with correct values from another method |

**Question 18** R11 · Foundation · Grade 4 · 3 marks

| Q         | Answer                           | Mark      | Comments                                |
|-----------|----------------------------------|-----------|-----------------------------------------|
| <b>18</b> | $37.5 \times 52$ or 1950         | <b>M1</b> | the hours Olu works in a year           |
|           | $24\,650 \div 1950$ or 12.641... | <b>M1</b> | oe, or $12.21 \times 1950$ or 23 809.50 |
|           | <b>Olu with £12.64</b>           | <b>A1</b> | or Olu with 23 809.50 and 24 650        |

**Question 19** R11 · Foundation · Grade 4 · 3 marks

| Q         | Answer                       | Mark      | Comments                                             |
|-----------|------------------------------|-----------|------------------------------------------------------|
| <b>19</b> | $25 \times 46$ or 1150       | <b>M1</b> | the number of pages                                  |
|           | $1150 \div 38$ or 30.26...   | <b>M1</b> | oe, or $1150 \div 38 \times 60$ or 1815.8... seconds |
|           | <b>30 minutes 16 seconds</b> | <b>A1</b> |                                                      |

**Question 20** R11 · Common · Grade 5 · 3 marks

| Q         | Answer                        | Mark      | Comments   |
|-----------|-------------------------------|-----------|------------|
| <b>20</b> | $5 \times 4 \times 2.5$ or 50 | <b>M1</b> | the volume |
|           | $525 \div 50$ or 10.5         | <b>M1</b> | oe         |
|           | <b>Silver with 10.5</b>       | <b>A1</b> |            |

**Question 21** R11 · Foundation · Grade 5 · 4 marks

| Q         | Answer                                                | Mark      | Comments                      |
|-----------|-------------------------------------------------------|-----------|-------------------------------|
| <b>21</b> | $45 \div 60$ or 0.75 hours or 45 minutes              | <b>M1</b> |                               |
|           | $0.75 + \frac{40}{60}$ or 85 minutes or 1.41... hours | <b>M1</b> | oe, the total time            |
|           | $75 \div$ their total time in hours                   | <b>M1</b> | oe                            |
|           | <b>52.9</b>                                           | <b>A1</b> | accept 52.9 or [52.94, 52.95] |

**Question 22** R11 · Common · Grade 5 · 4 marks

| Q            | Answer                                         | Mark      | Comments                                  |
|--------------|------------------------------------------------|-----------|-------------------------------------------|
| <b>22(a)</b> | $850 \div (1.2 \times 0.75)$ or $850 \div 0.9$ | <b>M1</b> |                                           |
|              | <b>944</b>                                     | <b>A1</b> | accept 944.4...                           |
| <b>22(b)</b> | $(850 + 260) \div 0.9$ or $1110 \div 0.9$      | <b>M1</b> | oe, or $1000 \times 0.9 = 900$ N          |
|              | <b>No with 1233</b>                            | <b>A1</b> | accept 1233.3..., or No with $1110 > 900$ |

**Question 23** R11 R1 · Common · Grade 5 · 3 marks

| Q         | Answer                           | Mark      | Comments                            |
|-----------|----------------------------------|-----------|-------------------------------------|
| <b>23</b> | $32 \times 1000$ or 32 000       | <b>M1</b> | or $9.2 \times 3600$ or 33 120      |
|           | $32\,000 \div 3600$ or 8.89...   | <b>M1</b> | oe, or $33\,120 \div 1000$ or 33.12 |
|           | <b>Theo with 8.89... and 9.2</b> | <b>A1</b> | or Theo with 32 and 33.12           |

**Question 24** R11 G16 · Common · Grade 5 · 3 marks

| Q         | Answer                                | Mark      | Comments                          |
|-----------|---------------------------------------|-----------|-----------------------------------|
| <b>24</b> | $520 \div 0.9$ or 577.8...            | <b>M1</b> | the volume                        |
|           | their $577.8 \div (\pi \times 3.5^2)$ | <b>M1</b> | oe, $\pi \times 3.5^2 = 38.48...$ |
|           | <b>15.0</b>                           | <b>A1</b> | accept 15.0 or [15.01, 15.02]     |

**Question 25** R11 R1 · Common · Grade 6 · 3 marks

| Q         | Answer                       | Mark      | Comments                                   |
|-----------|------------------------------|-----------|--------------------------------------------|
| <b>25</b> | $45 \div 1800$ or 0.025      | <b>M1</b> | the area in $\text{m}^2$                   |
|           | their $0.025 \times 10\,000$ | <b>M1</b> | oe, $1\,\text{m}^2 = 10\,000\,\text{cm}^2$ |
|           | <b>250</b>                   | <b>A1</b> |                                            |

### Question 26 R11 · Common · Grade 6 · 4 marks

| Q  | Answer                           | Mark | Comments                         |
|----|----------------------------------|------|----------------------------------|
| 26 | $300 \times 1.3$ or 390          | M1   | the mass of the syrup            |
|    | $1200 \times 1$ or 1200          | M1   | the mass of the water            |
|    | $(390 + 1200) \div (300 + 1200)$ | M1   | oe, their total mass $\div$ 1500 |
|    | <b>1.06</b>                      | A1   |                                  |

### Question 27 R11 G16 R1 · Foundation · Grade 6 · 4 marks

| Q  | Answer                                    | Mark | Comments                                          |
|----|-------------------------------------------|------|---------------------------------------------------|
| 27 | $\pi \times 28^2 \times 85$ or 209 356... | M1   | the volume in $\text{cm}^3$                       |
|    | their $209\,356 \div 1000$ or 209.4...    | M1   | litres                                            |
|    | their $209.4 \div 9.5$ or 22.04...        | M1   | minutes                                           |
|    | <b>22 minutes 2 seconds</b>               | A1   | accept 22 minutes 3 seconds from a rounded volume |

### Question 28 R11 R1 G16 · Foundation · Grade 6 · 4 marks

| Q  | Answer                                                | Mark | Comments                                             |
|----|-------------------------------------------------------|------|------------------------------------------------------|
| 28 | $7.2 \times 2.5$ or 18 mm                             | M1   | the depth of rain                                    |
|    | $8.5 \times 6.2 \times 0.018$ or $0.9486 \text{ m}^3$ | M1   | oe, their depth in m; or $850 \times 620 \times 1.8$ |
|    | their $0.9486 \times 1000$ or 948.6 litres            | M1   | oe                                                   |
|    | <b>Yes with 948.6 and 880, or 1068.6 and 1000</b>     | A1   |                                                      |

### Question 29 R11 · Foundation · Grade 6 · 4 marks

| Q  | Answer                                            | Mark | Comments                        |
|----|---------------------------------------------------|------|---------------------------------|
| 29 | $85 \div 72$ or 1.181... hours or 70.8... minutes | M1   |                                 |
|    | $135 - 20 -$ their 70.8 or 44.2... minutes        | M1   | oe, the time for the last 65 km |
|    | $65 \div$ their time in hours                     | M1   | oe, $65 \div 0.736...$          |
|    | <b>88.3</b>                                       | A1   | accept 88.3 or [88.30, 88.31]   |

**Question 30** R11 G16 · Common · Grade 7 · 5 marks

| Q         | Answer                       | Mark      | Comments                                                 |
|-----------|------------------------------|-----------|----------------------------------------------------------|
| <b>30</b> | $\pi \times 1.5^2 \times 12$ | <b>M1</b> | oe, 84.82... cm <sup>3</sup>                             |
|           | their volume $\times 8.96$   | <b>M1</b> | oe, 760.0... g                                           |
|           | $\times 50$ and $\div 1000$  | <b>M1</b> | oe, 38.00... kg                                          |
|           | their kg $\times 7.40$       | <b>M1</b> |                                                          |
|           | <b>£281.21</b>               | <b>A1</b> | accept [281.11, 281.31] from rounding the volume or mass |

**Question 31** R11 R5 · Common · Grade 7 · 4 marks

| Q         | Answer                                                   | Mark      | Comments                                             |
|-----------|----------------------------------------------------------|-----------|------------------------------------------------------|
| <b>31</b> | a mass shared in the ratio 13 : 7                        | <b>M1</b> | e.g. 13 g and 7 g, or 65 g and 35 g of a 100 g piece |
|           | $13 \div 8.96$ or 1.451... and $7 \div 7.13$ or 0.982... | <b>M1</b> | oe, the volume of each metal for their masses        |
|           | $20 \div (1.451... + 0.982...)$                          | <b>M1</b> | oe, their total mass $\div$ their total volume       |
|           | <b>8.22</b>                                              | <b>A1</b> | accept 8.22 or [8.221, 8.222]                        |

**Question 32** R11 G17 · Common · Grade 7 · 5 marks

| Q         | Answer                                                              | Mark      | Comments                                                                    |
|-----------|---------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------|
| <b>32</b> | $\frac{1}{3} \times \pi \times 4^2 \times 9$ or $48\pi$ or 150.8... | <b>M1</b> | the volume of the cone                                                      |
|           | $\frac{4}{3} \times \pi \times 1.2^3$ or $2.304\pi$ or 7.24...      | <b>M1</b> | the volume of one sphere                                                    |
|           | their 150.8 $\div$ their 7.24 or 20.83... and 20 spheres            | <b>M1</b> |                                                                             |
|           | (their 150.8 $- 20 \times$ their 7.24) $\times 7.85$                | <b>M1</b> | oe, 6.03... cm <sup>3</sup> left; or the masses of the cone and the spheres |
|           | <b>47.4</b>                                                         | <b>A1</b> | accept [47.2, 47.5]                                                         |

**Question 33** R11 R1 G16 · Common · Grade 7 · 4 marks

| Q         | Answer                                                          | Mark      | Comments                                           |
|-----------|-----------------------------------------------------------------|-----------|----------------------------------------------------|
| <b>33</b> | $\pi \times 1.2^2$ or 4.524...                                  | <b>M1</b> | the area of the end of the pipe in cm <sup>2</sup> |
|           | their 4.524 $\times 150$ or 678.6... cm <sup>3</sup> per second | <b>M1</b> | oe                                                 |
|           | $500\,000 \div$ their 678.6 or 736.8... seconds                 | <b>M1</b> | oe                                                 |
|           | <b>12 minutes 17 seconds</b>                                    | <b>A1</b> | accept 12 minutes 16 seconds                       |

### Question 34 R11 G16 · Common · Grade 7 · 5 marks

| Q            | Answer                                                                      | Mark      | Comments                                       |
|--------------|-----------------------------------------------------------------------------|-----------|------------------------------------------------|
| <b>34(a)</b> | $\pi \times 0.4^2 \times 1.5$ or 0.754...                                   | <b>M1</b> | the volume in $\text{m}^3$                     |
|              | their $0.754 \times 2400 \times 9.8$ or 17 734...                           | <b>M1</b> | oe, the force; mass 1809.6... kg               |
|              | their $17\,734 \div (\pi \times 0.4^2)$                                     | <b>M1</b> | oe, $\div 0.5027...$                           |
|              | <b>35 300</b>                                                               | <b>A1</b> | accept 35 280                                  |
| <b>34(b)</b> | <b>No, with the force (or mass) and the area both <math>\times 4</math></b> | <b>B1</b> | oe, or the pressure only depends on the height |

### Question 35 R11 N16 · Higher · Grade 8 · 4 marks

| Q         | Answer                         | Mark      | Comments                                                                 |
|-----------|--------------------------------|-----------|--------------------------------------------------------------------------|
| <b>35</b> | 2.45 or 54.5 seen              | <b>B1</b> | the upper bound of the distance or the lower bound of the time           |
|           | $2.45 \div 54.5$ or 0.04495... | <b>M1</b> | oe, upper distance $\div$ lower time; or $2450 \div 54.5 = 44.95...$ m/s |
|           | their $0.04495 \times 3600$    | <b>M1</b> | oe, a change to km/h                                                     |
|           | <b>No with 161.8...</b>        | <b>A1</b> | accept 162                                                               |

### Question 36 R11 R1 · Common · Grade 8 · 6 marks

| Q            | Answer                                        | Mark        | Comments                                                                   |
|--------------|-----------------------------------------------|-------------|----------------------------------------------------------------------------|
| <b>36(a)</b> | $96 - 80$ or 16 km/h                          | <b>M1</b>   | oe, how much faster the car is; or both speeds in m/s, 26.6... and 22.2... |
|              | $16 \times 1000 \div 3600$ or 4.444... m/s    | <b>M1</b>   | oe                                                                         |
|              | $(16.5 + 4.5) \div$ their 4.444               | <b>M1</b>   | oe, $21 \text{ m} \div$ the difference in speeds                           |
|              | <b>4.7</b>                                    | <b>A1</b>   | accept 4.73                                                                |
| <b>36(b)</b> | $96 \times 1000 \div 3600 \times$ their 4.725 | <b>M1</b>   | oe, or $80 \text{ km/h} \times$ their time + 21                            |
|              | <b>126</b>                                    | <b>A1ft</b> | accept [125, 126.5]                                                        |