| 1 |  | 12 × 9 × 6 |  | 2 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 648 |  | A1 | cao |
|  |  |  |  |  |  | **Total 2 marks** |

| 2 | (a) |  |  | 2 | B2 | for a correct simplified fraction  (B1 for oe or for ) |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | or |  | 2 | M1 |  |
|  |  |  | 36 |  | A1 |  |
|  | (c) | 28 ÷ 16 × 27 oe eg 1.75 × 27 or 1.75 × 11 |  | 2 | M1 | Fully correct method |
|  |  |  | 47.25 |  | A1 | cao |
|  |  |  |  |  |  | **Total 6 marks** |

| 3 | (a) | 6 × 8 – 4 × 3 |  | 2 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 36 |  | A1 |  |
|  | (b) | −41 = 6 × *p* − 4 × 5 or 6*p* = *T* + 4*d* or  6*p* = −41 + 4 × 5 |  | 3 | M1 | for correct substitution into the correct formula or a correct rearrangement for 6*p* |
|  |  | 6*p* = −41 + 20 or 6*p* = ‒21‒6*p* = 41 ‒ 20 or ‒6*p* = 21 or |  |  | M1 |  |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* |  |  | A1 | Oe  If no marks awarded  SCB1 for ‒266 |
|  | (c) | 4*x* – 12 or  oe |  | 3 | M1 | for a correct expansion of bracket **or** division of all terms in a correct equation by 4 |
|  |  | 4*x* – 7*x* = 15 + 12 or −12 – 15 = 7*x* – 4*x* or  −3*x* = 27 or  −27 = 3*x* |  |  | M1 | for a correct rearrangement within a correct equation with *x* terms on one side and the numbers on the other side |
|  |  | *Working required* | −9 |  | A1 | dep on M1  (SCB1 for an answer of *x* = − 6 with working shown from  4*x* – 3 = 7*x* + 15) |
|  |  |  |  |  |  | **Total 8 marks** |

| 4 |  | (360 – 122 – 122) ÷ 2 or 180 – 122 |  | 3 | M1 |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 58 |  | A1 | for 58° |
|  |  |  | 58 and correct reason |  | B1 | dep on M1for a reason for their method used  **allied** or **co-interior** angles add up to **180°**  or **corresponding** angles are **equal** (angles on a **straight line** add up to **180°)**  or **opposite angles** in a **rhombus** are **equal**  or angles of a **rhombus/quadrilateral** add up to **360°** |
|  |  |  |  |  |  | **Total 3 marks** |

| 5 | (a) | 54 ÷ 9 × 4 oe or  oe |  | 2 | M1 Allow 0.44(44…) × 54 or | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working* | 24 |  | A1 | |
|  | (b) | or or  54 – “24” (= 30) and “30” – “24”  or 2 × “30” – 54 |  | 2 | M1 ft if “24” < 27 or | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 6 |  | A1 | |
|  |  |  |  |  |  | **Total 4 marks** |

| 6 |  | 12 × 2.45 (= 29.4) **or** 21 ÷ 12 (= 1.75) |  | 3 | M1 |
| --- | --- | --- | --- | --- | --- |
|  |  | oe **or** oe **or**  oe **or**  oe |  |  | M1 or an answer of 140(%) |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 40 |  | A1 |
|  |  |  |  |  | **Total 3 marks** |

| 7 |  | × 25 000 (=1125) **or** **or**  1150 × 3 (= 3450) **or**  25 000 + 1150 × 3 (= 28 450)  (allow for this mark) |  | 4 | M1 finding 4.5% or 104.5% of 25 000 (allow for 3 × 0.045 × 25 000 oe)  **or**  the total interest for T bank  **or**  the total amount gained for T bank | | M2 for  (=28 529.(15313)) |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | × (25 000 + ‘1125’) (= 1175.625 or 1175 or 1176) **and** × (25 000 + ‘1125’ + ‘1175.625’) (= 1228.529) **or** |  |  | M1 completing the interest for C bank  **or**  completing the total amount for C bank | |
|  |  | ‘1125’ + ‘1176’ + ‘1229’ (= 3530) **or**  ‘28 529’ – 25 000 (=3529)  **and** 3 × 1150 (= 3450)  **or**  ‘28 529’ **and** 25 000 + ‘3450’ (= 28 450) |  |  | M1 for total interest for C bank and total interest for T bank  **or**  total amount for C bank and total amount for T bank | | |
|  |  | *Working required* | 79 or 80 |  | A1 dep on M2  Allow 79 - 80 | | |
|  |  |  |  |  |  | **Total 4 marks** | |

| 8 |  | 40, 80, 120, 160, 200, 240  48, 96, 144, 192, 240  **or**  40, 1h 20, 2h, 2h 40, 3h 20, 4h  48, 1h 36, 2h 24, 3h 12, 4h  **or**  6 40, 7 20, 8 00, 8 40, 9 20, 10 00  6 48, 7 36, 8 24, 9 12, 10 00  **or**  [(40 =) 8 × 5 and (48 =) 8 × 6 oe eg  40 = 2×2×2×5 and 48 =2×2×2×2×3 (could be numbers on ends of factor trees] |  | 3 | M1 | for listing multiples of 40 and 48 with at least 3 numbers in each list.  (Multiples could be given in minutes or in hours and minutes)  Or for listing times after 6 am for both trains, with at least 2 times in each list (allow one ft error)[mark until you have seen 2 correct times with only one ft error] |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (LCM =) 8 × 30 (= 240) or 4 or 10 (am) shown in lists but not given as answer |  |  | A1 | for 240 (minutes) or 4 (hours) |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 10 00 (am) |  | A1 | oe |
|  |  |  |  |  |  | **Total 3 marks** |

| 9 | (a) |  |  | 1 | B1 | 31/70  Accept 0.44(28571…..) or 44.(2…)% |
| --- | --- | --- | --- | --- | --- | --- |
|  | (b) | 4 × 6 + 12 × 14 + 20 × 19 + 28 × 25 + 36 × 6 (= 1488)    **or**  24 + 168 + 380 + 700 + 216 (= 1488) |  | 4 | M2 for at least **4** correct products added (need not be evaluated)  If not M2 then award:  M1 for consistent use of value within interval (including end points) for at least **4** products which must be added  or  correct midpoints used for at least **4** products and not added | |
|  |  | oe  eg ‘1488’ ÷ ‘70’ |  |  | M1 dep on at least M1  Allow division by their Σ*f* provided addition or total under column seen | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 21.26 |  | A1 awrt 21.26  accept 21.3 | |
|  |  |  |  |  |  | **Total 5 marks** |

| 10 |  |  |  | 3 | M1 | for substituting correctly into the speed formula |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | or or 0.75 or 45 |  |  | M1 | for correctly rearranging the speed formula for time |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 2 20 (pm) |  | A1 | Accept 14 20 |
|  |  |  |  |  |  | **Total 3 marks** |

| 11 | (a) | **or**  **or**  **or** oe 2.25 **or** 0.44(44…) **or** 1.8 **or** 0.55(55…) |  | 2 | M1 for a correct scale factor, accept ratio notation eg 45 : 20 | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 81 |  | A1 | |
|  | (b) | 54 ÷ 2.25 **or** 54 × 0.44(44…) oe **or** |  | 2 | M1 can ft if M1 scored in (a) | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 24 |  | A1 | |
|  |  |  |  |  |  | **Total 4 marks** |

| 12 |  | 0.22*x* = 5.48 oe or  (1% =) 5.48 ÷ 22 (= 0.24909…) or  100 ÷ 22 (= 4.54…) |  |  | M1 | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (*x* =) 5.48 ÷ 0.22 oe or  (100% =) 5.48 ÷ 22 × 100 or  “0.24909…” × 100 or  5.48 × “4.54…” |  |  | M1 | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 24.9 |  | A1 awrt 24.9 | |
|  |  |  |  |  |  | **Total 3 marks** |

| 13 |  | 2 × 0.75 (= 1.5) oe or 2 × 0.75 × 2 (= 3) oe |  | 5 | M1 for area of rectangle | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | *π* × (0.5 ÷ 2)2 (= 0.1963) or  *π* × (0.5 ÷ 2)2 (= 0.09817) |  |  | M1 for area of circle  **or**  area of semicircle | |
|  |  | “1.5” – “0.09817” (= 1.4018…) or  “3” – “0.1963” (= 2.8036…) |  |  | M1 | |
|  |  | “1.4018” × 2 × 250 ÷ 4 (= 175.228…) or  “2.8036” × 250 ÷ 4 (= 175.228…) or  “1.4018” × 250 ÷ 4 (= 87.6…) |  |  | M1or for 87 – 88 | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 175 |  | A1 Allow 175 – 176 | |
|  |  |  |  |  |  | **Total 5 marks** |

| 14 |  | *LW* = 180 oe (9*LW* = 1620) or  4*L* × (*L* + *W*) = 1620 oe or  5*W* × (*L* + *W*) = 1620 oe or  4*L* = 5*W* oe (oe or oe) |  | 5 | M2 for any two correct equations from  (i) *LW* = 180 oe (9*LW* = 1620)  (ii) 4*L* × (*L* + *W*) = 1620 oe  (iii) 5*W* × (*L* + *W*) = 1620 oe  (iv) 4*L* = 5*W* oe (oe or oe)  (M1 for one correct equation **or** 1620 ÷ 9 (= 180)) | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | oe or  oe or oe or  oe or  oe or oe or  oe or  oe |  |  | M1 for a correct equation in terms of one variable only | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | *L* = 15  and  *W* = 12 |  | A2 for both correct  (A1 for one correct)  Award 4 marks for *L* = 12 and *W* = 15 dep on M3 | |
|  |  |  |  |  |  | **Total 5 marks** |

| 15 |  | (5 ‒ 2) × 180 ‒ 112 ‒ 102 ‒ 96 (= 230) oe eg  (= 230)    **or**  360 ‒ (180 ‒ 112) ‒ (180 ‒ 102) ‒ (180 ‒ 96)  (= 360 ‒ 68 ‒ 78 ‒ 104 = 360 ‒ 230 = 130) oe |  | 5 | M1 | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (= 115) **or** ‘130’ ÷ 2 (= 65) |  |  | M1 dep on previous mark | |
|  |  | (= 135)**or** 180 – (360 ÷ 8) (= 135)**or** as exterior angle of octagon |  |  | M1 indep  Withhold the mark for  if shown as an interior angle | |
|  |  | 360 – ‘115’ – ‘135’**or**  ‘65’ + ‘45’ |  |  | M1 | |
|  |  | *Working required* | 110 |  | A1 dep on M1 | |
|  |  |  |  |  |  | **Total 5 marks** |

| 16 |  | oe |  | 5 | M1 for correctly using | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | M1 for correctly rearranging for *V* | |
|  |  | oe |  |  | M1ft their 2000 for their *V* | |
|  |  | oe (= 6.3661…) |  |  | M1ft their 2000 dep on previous M1 for correctly rearranging for *h* | |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 6.4 |  | A1 awrt 6.4 | |
|  |  |  |  |  |  | **Total 5 marks** |

| 17 |  | 1.75 × 106 ÷ 2.4 × 107 or  1 750 000 ÷ 24 000 000 oe eg |  | 3 | M1 |
| --- | --- | --- | --- | --- | --- |
|  |  | 0.0729(16…) or 0.072 or 0.073 or for or 7.29(16…)% or 7.2% or 7.3% |  |  | A1 |
|  |  | *Correct answer scores full marks (unless from obvious incorrect working)* | 7.3 × 10−2 |  | A1 accept 7.3 × 10−2 or better  (7.29(16….) × 10−2) |
|  |  |  |  |  | **Total 3 marks** |

| 18 | and oe  **or**  and oe | | | | M2 for an arithmetical method (must see the calculation to find 0.22 or 0.26 or 0.74 and 0.48 oe)  E.g.  6.1(0) – 5.88 (= 0.22) oe  **or**  3.92 – 3.66 (= 0.26) oe  **or**  1.96 – 1.22 (= 0.74) oe and 1.22 – “0.74” (= 0.48) | |  | | 5 | | M1 for setting up both equations oe  Allow the use of apples and pears oe throughout, e.g.  5 apples + 3 pears = 1.96 and  3 apples + 2 pears = 1.22 | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | E.g.    Subtracting | | | E.g.    Subtracting |  | |  | | M1 for a correct method to eliminate *a* or *p*: coefficients of *a* or *p* the same **and** correct operation to eliminate selected variable (condone any one arithmetic error) **or**  to find the cost of 1 apple and 1 pear | | |
| E.g.  and oe  Subtracting | | | |
|  | E.g.    or | | | E.g.    or | E.g.  3 × 0.22 (= 0.66)  1.96 – “0.66” (= 1.3(0))  “1.3(0)” ÷ 5 (= 0.26)  **or**  5 × 0.26 (= 1.3(0))  1.96 – “1.3(0)” (= 0.66)  “0.66” ÷ 3 (= 0.22)  **or**  Apple and pear is 0.48 oe | |  | |  | | M1 (dep on M2) for substituting their value found (must be > 0) of one variable into one of the equations **or**  for repeating above method to find second variable **or**  for third working column allow**or**  for a complete arithmetical method to find the other value | | |
| E.g  oe | | | |
|  | or oe or | | | | | |  | |  | | M1 (dep on M3) can be implied by  10(*a* + *p*) provided *a* and *p* must be > 0 | | |
|  | *Working required* | | | | | | 4.8(0) | |  | | A1 dep M2 | | |
|  |  | | | | | |  | |  | |  | **Total 5 marks** | |
| 19 | |  | eg oe **or** oe **or** oe or oe | | |  | | 4 | | M1 or  **and** | | |
|  | |  | eg (= 11.80….) **or**  (= 11.80….) **or**  (*BC* =)(= 11.80…) oe | | |  | |  | | M1 or | | |
|  | |  | ‘11.8’ + ’11.8’ + 9.3 + 9.3 or  ’11.8’ × 2 + 9.3 × 2 oe | | |  | |  | | M1 | | |
|  | |  | *Correct answer scores full marks (unless from obvious incorrect working)* | | | 42.2 | |  | | A1 awrt 42.2 | | |
|  | |  |  | | |  | |  | | **Total 4 marks** | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Edexcel averages: scores of candidates who achieved grade:** | | | | | | |
| **Qn** | **Max score** | **Mean**  **score** | **Mean**  **%** | **ALL** | **5** | **4** | **3** | **2** | **1** | **U** |
| **1** | 1.31 | 2 | 66 | 1.31 | 1.92 | 80 | 1.60 | 0.88 | 0.64 | 0.12 |
| **2** | 4.18 | 6 | 70 | 4.18 | 5.43 | 77 | 4.60 | 3.63 | 3.05 | 1.09 |
| **3** | 4.80 | 8 | 60 | 4.80 | 7.12 | 66 | 5.26 | 3.74 | 2.32 | 0.75 |
| **4** | 1.61 | 3 | 54 | 1.61 | 2.28 | 59 | 1.78 | 1.36 | 0.87 | 0.30 |
| **5** | 1.96 | 4 | 49 | 1.96 | 2.84 | 55 | 2.20 | 1.51 | 1.00 | 0.53 |
| **6** | 1.44 | 3 | 48 | 1.44 | 2.22 | 49 | 1.46 | 0.99 | 0.74 | 0.30 |
| **7** | 1.58 | 4 | 40 | 1.58 | 2.82 | 40 | 1.58 | 0.88 | 0.51 | 0.15 |
| **8** | 1.16 | 3 | 39 | 1.16 | 2.03 | 38 | 1.13 | 0.68 | 0.51 | 0.06 |
| **9** | 1.76 | 5 | 35 | 1.76 | 3.48 | 37 | 1.85 | 0.58 | 0.35 | 0.03 |
| **10** | 1.29 | 3 | 43 | 1.29 | 2.44 | 36 | 1.09 | 0.74 | 0.37 | 0.03 |
| **11** | 1.41 | 4 | 35 | 1.41 | 3.20 | 26 | 1.04 | 0.32 | 0.13 | 0.00 |
| **12** | 0.97 | 3 | 32 | 0.97 | 1.84 | 26 | 0.77 | 0.53 | 0.31 | 0.08 |
| **13** | 1.05 | 5 | 21 | 1.05 | 2.23 | 17 | 0.84 | 0.30 | 0.14 | 0.06 |
| **14** | 1.07 | 5 | 21 | 1.07 | 2.18 | 15 | 0.76 | 0.45 | 0.36 | 0.14 |
| **15** | 1.19 | 5 | 24 | 1.19 | 2.95 | 12 | 0.62 | 0.22 | 0.01 | 0.00 |
| **16** | 1.16 | 5 | 23 | 1.16 | 2.73 | 11 | 0.57 | 0.32 | 0.04 | 0.14 |
| **17** | 0.27 | 3 | 9 | 0.27 | 0.61 | 8 | 0.24 | 0.04 | 0.00 | 0.03 |
| **18** | 0.88 | 5 | 18 | 0.88 | 2.26 | 7 | 0.36 | 0.15 | 0.03 | 0.00 |
| **19** | 0.67 | 4 | 17 | 0.67 | 1.81 | 6 | 0.24 | 0.00 | 0.05 | 0.00 |
|  | **29.76** | **80** | **37** | **29.76** | **52.39** | **27.99** | **17.32** | **11.43** | **3.81** | **1.76** |

**Suggested grade boundaries**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grade** | **5** | **4** | **3** | **2** | **1** |
| Mark | 40 | 23 | 14 | 8 | 2 |