

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| Q        | Working                                                                                            | Answer | Mark | Notes                                |
|----------|----------------------------------------------------------------------------------------------------|--------|------|--------------------------------------|
| <b>1</b> | $8^2 + 15^2 (= 289)$                                                                               | 167    | 5    | M1                                   |
|          | $\sqrt{8^2 + 15^2} (= 17)$                                                                         |        |      | M1                                   |
|          | $\pi \times \left( \frac{17}{2} \right)^2 (= 226.98...) \text{ or } 0.5 \times 15 \times 8 (= 60)$ |        |      | M1                                   |
|          | $\pi \times \left( \frac{17}{2} \right)^2 - 0.5 \times 15 \times 8$<br>( “226.98” – “60” )         |        |      | M1                                   |
|          |                                                                                                    |        |      | A1 Accept answers which round to 167 |
|          |                                                                                                    |        |      | <b>Total 5 marks</b>                 |

Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries

| Q     | Working                                                                                                                           | Answer           | Mark | Notes                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|-----------------------------------------------------------------------------------------------------------------------------------|------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 (a) |                                                                                                                                   | $70 < s \leq 80$ | 1    | B1                                                                                                                                                                                                                                                                                                                                                                                                |
| (b)   | $10 \times 45 + 16 \times 55 + 19 \times 65 + 23 \times 75 + 12 \times 85$<br><b>or</b> $450 + 880 + 1235 + 1725 + 1020 (= 5310)$ |                  | 4    | <p>M2 <math>f \times d</math> for at least 4 products with correct mid-interval values and intention to add.</p> <p>If not M2 then award M1</p> <p>for <math>d</math> used consistently for at least 4 products within interval (including end points) and intention to add</p> <p><b>or</b></p> <p>for at least 4 correct products with correct mid-interval values with no intention to add</p> |
|       | "5310" $\div 80$                                                                                                                  |                  |      | M1 dep on at least M1 allow division by their $\sum f$ provided addition or total under column seen                                                                                                                                                                                                                                                                                               |
|       |                                                                                                                                   | 66.4             |      | A1 accept 66.37 – 66.4                                                                                                                                                                                                                                                                                                                                                                            |
|       |                                                                                                                                   |                  |      | <b>Total 5 marks</b>                                                                                                                                                                                                                                                                                                                                                                              |

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| Q | Working | Answer                                                                        | Mark | Notes                                  |
|---|---------|-------------------------------------------------------------------------------|------|----------------------------------------|
| 3 | (a)     | $520 - 465 (= 55) \text{ or } \frac{520}{465} (= 1.118\dots)$                 | 3    | M1                                     |
|   |         | $\frac{"55"}{465} \times 100 \text{ or } 100 \times ("1.118" - 1) \text{ oe}$ |      | M1                                     |
|   |         |                                                                               |      | A1 11.8 or better (11.827956...)       |
|   | (b)     | $0.12 \times 550 \text{ oe } (= 66)$                                          | 3    | M1 oe                                  |
|   |         | $550 - "66"$                                                                  |      | M2 for<br>$0.88 \times 550 \text{ oe}$ |
|   |         |                                                                               |      | A1                                     |
|   |         |                                                                               |      | <b>Total 6 marks</b>                   |

|   |                                                                                                                                        |      |   |                                                                                                |
|---|----------------------------------------------------------------------------------------------------------------------------------------|------|---|------------------------------------------------------------------------------------------------|
| 4 | 6 hrs 39 mins = 6.65 (hrs) or<br>$6\frac{39}{60} \text{ or } 6\frac{13}{20} \text{ or } \frac{133}{20} \text{ or } 399 \text{ (mins)}$ |      | 3 | B1                                                                                             |
|   | Average speed = $\frac{429}{6.65} \text{ oe eg } \frac{429}{399} \times 60$                                                            |      |   | M1 Use of $S = D \div T$ (use of their time in hours)<br>[allow $429 \div 6.39$ if B0 awarded] |
|   |                                                                                                                                        | 64.5 |   | A1 Awrt 64.5                                                                                   |
|   |                                                                                                                                        |      |   | <b>Total 3 marks</b>                                                                           |

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| <b>Q</b>     | <b>Working</b>                                                                                  | <b>Answer</b>            | <b>Mark</b> | <b>Notes</b>                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------|--------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>5</b> (a) | for $0.035 \times 40\,000$ oe (= 1400)<br><b>or</b> $1.035 \times 40\,000$ oe (= 41 400)        | <b>OR</b>                | 3           | M1 for finding 3.5% <b>or</b> 103.5% of 40 000                                                                                                                                             |
|              | $1.035 \times \text{“41 400”}$ oe (= 42 849)<br>$1.035 \times \text{“42 849”}$ oe (= 44 348.72) | $40\,000 \times 1.035^3$ |             | M1 for completing method to find total amount in the account                                                                                                                               |
|              |                                                                                                 | 44 349                   |             | A1 accept 44 348 – 44 349                                                                                                                                                                  |
|              |                                                                                                 |                          |             | SC: if no other marks gained award M1 for $0.105 \times 40\,000$ oe <b>or</b> 4200 <b>or</b> 44 200<br><br>accept $(1 + 0.035)$ as equivalent to 1.035 throughout                          |
| (b)          | e.g. $30\,481 \div (1 - 0.065)$ <b>or</b> $30\,481 \div 0.935$                                  |                          | 3           | M2 for a complete method<br><br>(M1) for $30\,481 \div (100 - 6.5)$ (= 326)<br><b>or</b> $(100 - 6.5)\% = 30\,481$ <b>or</b> $93.5\% = 30\,481$<br><b>or</b> e.g. $(1 - 0.065)x = 30\,481$ |
|              |                                                                                                 | 32 600                   |             | A1                                                                                                                                                                                         |
|              |                                                                                                 |                          |             | <b>Total 6 marks</b>                                                                                                                                                                       |

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| <b>Q</b> | <b>Working</b>                                                                                             | <b>Answer</b> | <b>Mark</b> | <b>Notes</b>         |                                                         |
|----------|------------------------------------------------------------------------------------------------------------|---------------|-------------|----------------------|---------------------------------------------------------|
| <b>6</b> | e.g. $0.7 \times 20\,160$ oe (= 14 112)<br><b>or</b> $0.3 \times 20\,160$ oe (= 6048)                      |               | 4           | M1                   |                                                         |
|          | e.g. “14 112” $\div (9 + 5 + 2)$ (= 882)<br><b>or</b> $(20\,160 - \text{“6048”}) \div (9 + 5 + 2)$ (= 882) |               |             | M1                   | M2 for<br>$\frac{9-2}{9+5+2} \times \text{“14 112”}$ oe |
|          | e.g. $9 \times \text{“882”} - 2 \times \text{“882”}$                                                       |               |             | M1                   |                                                         |
|          |                                                                                                            | 6174          |             | A1                   |                                                         |
|          |                                                                                                            |               |             | <b>Total 4 marks</b> |                                                         |

Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries

| Q | Working                                                                                                                                                                                                                                                                                                                                                       | Answer | Mark | Notes                                                                                                                                                                                                        |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7 | e.g. $\sin 65 = \frac{16}{AB}$ <b>or</b> $\cos 25 = \frac{16}{AB}$<br><b>or</b> $\frac{AB}{\sin 90} = \frac{16}{\sin 65}$ <b>or</b> $\tan 65 = \frac{16}{AD}$<br><b>or</b> $\tan 25 = \frac{AD}{16}$ <b>or</b> $\frac{AD}{\sin 25} = \frac{16}{\sin 65}$                                                                                                      |        | 4    | M1 for a correct trig ratio for <i>AB</i> <b>or</b> <i>AD</i><br>accept 180 – 90 – 65 for 25                                                                                                                 |
|   | e.g. $(AB) = \frac{16}{\sin 65} (= 17.654\dots)$<br><b>or</b> $(AB) = \frac{16}{\cos 25} (= 17.654\dots)$<br><b>or</b> $(AB) = \frac{16 \sin 90}{\sin 65} (= 17.654\dots)$<br><b>and</b><br>$(AD) = \frac{16}{\tan 65} (= 7.460\dots)$<br><b>or</b> $(AD) = 16 \times \tan 25 (= 7.460\dots)$<br><b>or</b> $(AD) = \frac{16 \sin 25}{\sin 65} (= 7.460\dots)$ |        |      | M1 for finding <i>AB</i> <b>and</b> <i>AD</i><br><br>Allow use of Pythagoras<br><br>$(AD) = \sqrt{17.654\dots^2 - 16^2} (= 7.460\dots)$<br><br>or<br><br>$(AB) = \sqrt{7.460\dots^2 + 16^2} (= 17.654\dots)$ |
|   | $(“17.654\dots” \times 2) + (“7.460\dots” \times 2)$ oe                                                                                                                                                                                                                                                                                                       |        |      | M1 for a complete method to find the perimeter                                                                                                                                                               |
|   |                                                                                                                                                                                                                                                                                                                                                               | 50.2   |      | A1 accept 49.6 – 50.6                                                                                                                                                                                        |
|   |                                                                                                                                                                                                                                                                                                                                                               |        |      | <b>Total 4 marks</b>                                                                                                                                                                                         |

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| <b>Q</b> | <b>Working</b>                                            | <b>Answer</b> | <b>Mark</b> | <b>Notes</b>                                          |
|----------|-----------------------------------------------------------|---------------|-------------|-------------------------------------------------------|
| <b>8</b> | $5 \times 398 (= 1990) \text{ or } 6 \times 401 (= 2406)$ |               | <b>3</b>    | M1 Correct total for 5 or for 6 cocoa pods            |
|          | “2406” – “1990”                                           |               |             | M1 (M2 for $398 + 6 \times 3$ or $401 + 5 \times 3$ ) |
|          |                                                           | 416           |             | A1                                                    |
|          |                                                           |               |             | <b>Total 3 marks</b>                                  |

|          |     |                                      |     |          |                                  |
|----------|-----|--------------------------------------|-----|----------|----------------------------------|
| <b>9</b> | (a) |                                      |     | <b>2</b> | M1 for use of cf at 45           |
|          |     |                                      | 146 |          | A1 accept in the range 145 – 147 |
|          | (b) | $93.75 \div 3.75 (= 25)$             |     | <b>3</b> | M1                               |
|          |     | Using cf diagram at 90 – “25” (= 65) |     |          | M1 for use of cf at “65”         |
|          |     |                                      | 151 |          | A1 accept in the range 150 – 152 |
|          |     |                                      |     |          | <b>Total 5 marks</b>             |

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| Q  | Working                                                                                                                                                                                                                                     | Answer | Mark | Notes                                                                                                                                                                                                                                                                                                                      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | eg $20 \times \frac{9a-7}{5} - 20 \times \frac{3a-7}{4} = 20 \times 4.55 (= 91)$ or<br>eg $4(9a-7) - 5(3a-7) = 20 \times 4.55$ or<br>eg $\frac{4(9a-7)}{20} - \frac{5(3a-7)}{20} (= 4.55)$ or<br>eg $\frac{4(9a-7) - 5(3a-7)}{20} (= 4.55)$ |        | 3    | M1 For clear intention to multiply all terms by 20 (or $4 \times 5$ ) or a multiple of 20 oe or to express LHS as two fractions over 20 (or $4 \times 5$ ) or a multiple of 20 oe or as a single fraction with a denominator of 20 (or $4 \times 5$ ) or a multiple of 20 oe<br><br>if expanded numerator, allow one error |
|    | eg $36a - 28 - 15a + 35 = 20 \times 4.55$ or $21a = 84$ oe                                                                                                                                                                                  |        |      | M1 Expanding brackets and multiplying by denominator with no more than one sign error                                                                                                                                                                                                                                      |
|    |                                                                                                                                                                                                                                             | 4      |      | A1 dep on M1                                                                                                                                                                                                                                                                                                               |

|    |          |  |     |   |                         |
|----|----------|--|-----|---|-------------------------|
| 11 | (a) (i)  |  | 62  | 3 | B1                      |
|    | (a) (ii) |  | 118 |   | B1ft 180 – their (a)(i) |
|    | (b)      |  | 62  |   | B1                      |
|    |          |  |     |   | <b>Total 3 marks</b>    |

Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries

| Q  | Working                                                                           | Answer | Mark | Notes                                                                                                                             |
|----|-----------------------------------------------------------------------------------|--------|------|-----------------------------------------------------------------------------------------------------------------------------------|
| 12 | 9.55 or 9.65 or 3.75 or 3.85 or 1.835 or 1.845                                    |        | 3    | B1 accept 9.649̇ for 9.65, 3.849̇ for 3.85, 1.8449̇ for 1.845                                                                     |
|    | $a = \frac{UB_v - LB_u}{LB_l}$ e.g. $a = \frac{9.65 - 3.75}{1.835} (= 3.2152...)$ |        |      | M1 for correct substitution of $9.6 < UB_v \leq 9.65$<br><b>and</b> $3.75 \leq LB_u < 3.8$<br><b>and</b> $1.835 \leq LB_l < 1.84$ |
|    |                                                                                   | 3.22   |      | A1 accept 3.21 – 3.22 from correct working                                                                                        |
|    |                                                                                   |        |      | <b>Total 3 marks</b>                                                                                                              |

|    |                                                                                                                                                                                                                                                                                        |      |   |                                                                                                           |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|-----------------------------------------------------------------------------------------------------------|
| 13 | $2 \times \pi \times 7 (= 43.982... \text{ or } 14\pi)$<br><b>or</b> $(2 \times \pi \times 7) \div 2 (= 21.991... \text{ or } 7\pi)$<br><b>or</b> $2 \times \pi \times 9 (= 56.548... \text{ or } 18\pi)$<br><b>or</b> $(2 \times \pi \times 9) \div 2 (= 28.274... \text{ or } 9\pi)$ |      | 3 | M1 for finding the circumference of either the full circle or the length of the arc for either semicircle |
|    | e.g. “21.991” + “28.274” (= 50.26...)<br><b>or</b> “7π” + “9π” (= 16π)<br><b>or</b> “21.991” + “28.274” + 2 (= 52.26...)<br><b>or</b> “7π” + “9π” + 2 (= 52.26...)<br><b>or</b> “21.991” + “28.274” + 2 + 2<br><b>or</b> “7π” + “9π” + 2 + 2                                           |      |   | M1 for a method to find the length of the two arcs with intention to add                                  |
|    |                                                                                                                                                                                                                                                                                        | 54.3 |   | A1 accept 54.2 – 54.3                                                                                     |
|    |                                                                                                                                                                                                                                                                                        |      |   | <b>Total 3 marks</b>                                                                                      |

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| Q  | Working                                                                                                                                                                                                                                                                                                                                                                        | Answer          | Mark | Notes                                                                  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------------------------------------------------------------------------|
| 14 | $\text{eg } \frac{4}{5} \times \frac{3}{7} (= \frac{12}{35}) \text{ oe or } 0.24 \times \frac{4}{7} (= \frac{96}{700}) \text{ oe or}$<br>$\text{eg } \frac{4}{5} \times 3 (= \frac{12}{5} = 2.4) \text{ and } 0.24 \times 4 (= \frac{24}{25} = 0.96) \text{ (or 3.36) or}$<br>$\text{eg } \frac{4}{5} \times 300 (= 240) \text{ and } 0.24 \times 400 (= 96) \text{ (or 336)}$ | $\frac{12}{25}$ | 3    | M1                                                                     |
|    | $\text{eg } \frac{12}{35} + \frac{96}{700} (= \frac{336}{700}) \text{ oe or}$<br>$\frac{2.4 + 0.96}{3 + 4} (= \frac{3.36}{7}) \text{ oe or}$<br>$\text{eg } \frac{240 + 96}{300 + 400} (= \frac{336}{700}) \text{ oe}$                                                                                                                                                         |                 |      | M1 or 0.48 or 48% or correct unsimplified fraction eg $\frac{84}{175}$ |
|    |                                                                                                                                                                                                                                                                                                                                                                                |                 |      | A1 cao                                                                 |
|    |                                                                                                                                                                                                                                                                                                                                                                                |                 |      | <b>Total 3 marks</b>                                                   |

**Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries**

| <b>Q</b>  | <b>Working</b>                                                                                                                                                                                                      | <b>Answer</b> | <b>Mark</b> | <b>Notes</b>                                                                                                                                    |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>15</b> | e.g. $30 \times 20 \times 125 (= 75\,000)$<br>or $85 \times 40 \times 125 (= 425\,000)$<br>or $(60 \times 30 + (85 - 30) \times 40) \times 125 (= 500\,000)$ oe                                                     |               | 4           | M1 for a method to find the volume of water already pumped out <b>or</b> the volume of water left <b>or</b> the total volume of the container   |
|           | “75 000” $\div$ 1.5 (= 50 000)<br>or “75 000” $\div$ 90 (= 833.3... or $\frac{2500}{3}$ )<br>or “425000” $\div$ “75000” (= 5.66... or $\frac{17}{3}$ )<br>or “500000” $\div$ “75000” (= 6.66... or $\frac{20}{3}$ ) |               |             | M1<br>M2 for $\frac{\text{"425000"}}{\text{"75000"}} \times 1.5$ oe (= 8.5)<br>or $\frac{\text{"500000"}}{\text{"75000"}} \times 1.5$ oe (= 10) |
|           | “425 000” $\div$ “50 000” (= 8.5)<br>or “425 000” $\div$ (“833.3...” $\times$ 60) oe (= 8.5)<br>or “5.66...” $\times$ 1.5 (= 8.5) <b>or</b> “6.66...” $\times$ 1.5 (= 10)                                           |               |             | M1                                                                                                                                              |
|           |                                                                                                                                                                                                                     | 20 30         |             | A1 Allow 8 30 (pm)                                                                                                                              |
|           |                                                                                                                                                                                                                     |               |             | <b>Total 4 marks</b>                                                                                                                            |

Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries

| Q  | Working                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Answer | Mark | Notes                                                                                                                |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|----------------------------------------------------------------------------------------------------------------------|
| 16 | $(BC^2 =) 150^2 + 275^2 - (2 \times 150 \times 275 \times \cos 120) (= 139\,375)$                                                                                                                                                                                                                                                                                                                                                                              |        | 5    | M1 for correct substitution into the cosine rule                                                                     |
|    | $(BC =) \sqrt{150^2 + 275^2 + 41250}$ oe or $\sqrt{139375}$<br>or $25\sqrt{223}$ or 373....                                                                                                                                                                                                                                                                                                                                                                    |        |      | M1 for correct order of operations and square root                                                                   |
|    | e.g. $\frac{\sin ABC}{275} = \frac{\sin 120}{"373..."}$<br>or $275^2 = 150^2 + "373..."^2 - (2 \times 150 \times "373..." \times \cos ABC)$<br>or $\cos ABC = \frac{150^2 + "373..."^2 - 275^2}{2 \times 150 \times "373..."}$<br>or $\frac{\sin ACB}{150} = \frac{\sin 120}{"373..."}$<br>or $150^2 = 275^2 + "373..."^2 - (2 \times 275 \times "373..." \times \cos ACB)$<br>or $\cos ACB = \frac{275^2 + "373..."^2 - 150^2}{2 \times 275 \times "373..."}$ |        |      | M1 (dep on 1 <sup>st</sup> M1) ft 373...<br><br>for a correct trig statement involving angle $ABC$<br>or angle $ACB$ |
|    | $(ABC =) \sin^{-1} \left( \frac{\sin 120}{"373..."} \times 275 \right) (= 39.6...)$<br>or $(ABC =) \cos^{-1} \left( \frac{150^2 + "373..."^2 - 275^2}{2 \times 150 \times "373..."} \right) (= 39.6...)$<br>or $(ACB =) \sin^{-1} \left( \frac{\sin 120}{"373..."} \times 150 \right) (= 20.3...)$<br>or $(ACB =) \cos^{-1} \left( \frac{275^2 + "373..."^2 - 150^2}{2 \times 275 \times "373..."} \right) (= 20.3...)$                                        |        |      | M1 for a complete method to find angle $ABC$ or angle $ACB$                                                          |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 140    |      | A1 accept 140 – 140.4                                                                                                |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |      | <b>Total 5 marks</b>                                                                                                 |

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| Q  | Working | Answer                                                                                                                                                                                                                                                                                                                                                                                                                | Mark               | Notes |                                                                                                                                                    |
|----|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 | (a)     | $63 \div 1.5 (= 42)$ <b>or</b> a correct value written on FD scale (10 small squares = FD 10) <b>or</b><br>10 squares = 1 parcel or 1 big square = 2.5 parcels oe<br><br>eg $area = 18 \times 5 + 15 \times 42 + 10 \times 24 + 10 \times 30 + 20 \times 8 (= 1420)$<br>$3.6 \times 1 + 3 \times 8.4 + 2 \times 4.8 + 2 \times 6 + 4 \times 1.6 (= 56.8)$<br>(at least 3 bars correct for any method of summing area) |                    | 3     | M1 For use of area related to frequency eg showing a correct unambiguous value on the frequency density scale or calculating the area in some form |
|    |         | $0.5 \times 18 + 63 + 1 \times 24 + 1 \times 30 + 2 \times 8$<br>( $9 + 63 + 24 + 30 + 16$ ) oe<br><br>eg “1420” $\div 10$ or “56.8” $\times 2.5$ oe                                                                                                                                                                                                                                                                  |                    |       | M1 Total of 5 frequencies with just one error or<br>Area of bars with just one error, with correct calculation to give frequency                   |
|    |         |                                                                                                                                                                                                                                                                                                                                                                                                                       | 142                |       | A1                                                                                                                                                 |
|    | (b)     | $0.75 \times 24 (= 18) + 30 + 16 (= 64)$ oe<br>Eg “their (a)” – ( $9 + 63 + 0.25 \times 24$ ) (= 64)<br>(ft figures from (a) dep on M1 for (a))                                                                                                                                                                                                                                                                       |                    | 3     | M1ft (dep on M1 in (a))if working with small squares they may get eg<br>$\frac{640}{1420}$                                                         |
|    |         | $\frac{"64"}{142} \times \frac{"63"}{141}$ (ft their value of 142 from (a))                                                                                                                                                                                                                                                                                                                                           |                    |       | M1 64 must come from correct working allow $\frac{"64"}{142} \times \frac{"64"}{142}$ (ft their value of 142 from (a))                             |
|    |         |                                                                                                                                                                                                                                                                                                                                                                                                                       | $\frac{672}{3337}$ |       | A1 0.201 or better (0.20137...)                                                                                                                    |
|    |         |                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |       | <b>Total 6 marks</b>                                                                                                                               |

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|----|------------------------------------------------------------------------------------------------------------------------------------------|--------|------|-----------------------------------------------------------------------|
| 18 | $\sqrt[3]{\frac{4352}{1836}}$ or $\frac{4}{3}$ or 1.33(33...) or 4:3<br>or $\sqrt[3]{\frac{1836}{4352}}$ or $\frac{3}{4}$ or 0.75 or 3:4 |        | 3    | M1 for a correct length scale factor or a correct length ratio        |
|    | e.g. $1120 \div \left(\frac{4}{3}\right)^2$ oe or $1120 \times \left(\frac{3}{4}\right)^2$ oe                                            |        |      | M1 (dep on M1) for a correct method to work out the surface area of A |
|    |                                                                                                                                          | 630    |      | A1                                                                    |
|    |                                                                                                                                          |        |      | <b>Total 3 marks</b>                                                  |

|    |                                                                                                                                                                  |      |   |                                                                                                    |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|----------------------------------------------------------------------------------------------------|
| 19 | eg $(AD =) \sqrt{6^2 + 6^2 - 2 \times 6 \times 6 \times \cos(50)}$ (= 5.07...) or $2 \times 6 \sin 25$ (= 5.07...) or $\frac{6 \sin 50}{\sin 65}$ (= 5.07...) oe |      | 6 | M1 Correct expression for $AD$ ie $AD = \dots$ or $x =$ oe                                         |
|    | eg $6 + 6 + \sqrt{6^2 + 6^2 - 2 \times 6 \times 6 \times \cos(50)}$ or $12 + "5.07..."$ (= 17.0) 7... or 17.1)                                                   |      |   | M1 A <b>correct</b> statement of perimeter of triangle $OAD$                                       |
|    | eg $(\text{arc } BC =) \frac{50}{360} \times \pi \times 2 \times (6 + x)$ oe                                                                                     |      |   | M1 A correct statement for arc $BC$ (condone missing brackets around $(6 + x)$ for this mark only) |
|    | eg $2 \times "17.1" = 12 + 2x + \frac{50}{360} \times \pi \times 2 \times (6 + x)$ oe                                                                            |      |   | M1 dep on M3 for a correct equation for $x$                                                        |
|    | eg $2 \times 17.1 - 12 - \frac{30}{18} \pi = 2x + \frac{5x}{18} \pi$                                                                                             |      |   | M1 isolating terms in $x$ in a correct equation                                                    |
|    |                                                                                                                                                                  | 5.89 |   | A1 5.88 – 5.89                                                                                     |
|    |                                                                                                                                                                  |      |   | <b>Total 6 marks</b>                                                                               |

## Practice Tests Set 16 – Paper 2H-3H mark scheme, performance data and suggested grade boundaries

| Qn | Paper | Question | Mean score   | Max score | Mean % | Edexcel averages: scores of candidates who achieved grade: |              |              |              |              |              |              |             |             |
|----|-------|----------|--------------|-----------|--------|------------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|
|    |       |          |              |           |        | ALL                                                        | 9            | 8            | 7            | 6            | 5            | 4            | 3           | U           |
| 1  | 2H    | Q08      | 3.83         | 5         | 77     | 3.83                                                       | 4.90         | 4.77         | 4.59         | 4.14         | 3.07         | 1.33         | 0.49        | 0.29        |
| 2  | 1H    | Q02      | 3.98         | 5         | 80     | 3.98                                                       | 4.92         | 4.76         | 4.50         | 4.09         | 3.39         | 2.41         | 1.42        | 0.38        |
| 3  | 2H    | Q03      | 4.93         | 6         | 82     | 4.93                                                       | 5.78         | 5.44         | 5.37         | 5.02         | 4.48         | 3.95         | 2.56        | 1.05        |
| 4  | 2H    | Q01      | 2.34         | 3         | 78     | 2.34                                                       | 2.97         | 2.81         | 2.60         | 2.41         | 1.85         | 1.40         | 0.62        | 0.37        |
| 5  | 1H    | Q07      | 4.37         | 6         | 73     | 4.37                                                       | 5.79         | 5.45         | 5.08         | 4.26         | 3.10         | 2.18         | 1.29        | 0.44        |
| 6  | 1H    | Q01      | 2.99         | 4         | 75     | 2.99                                                       | 3.80         | 3.67         | 3.34         | 2.96         | 2.52         | 1.74         | 0.66        | 0.36        |
| 7  | 1H    | Q10      | 2.58         | 4         | 65     | 2.58                                                       | 3.79         | 3.53         | 3.21         | 2.53         | 1.30         | 0.38         | 0.14        | 0.00        |
| 8  | 2H    | Q07      | 1.89         | 3         | 63     | 1.89                                                       | 2.92         | 2.56         | 2.21         | 1.55         | 0.96         | 0.42         | 0.24        | 0.07        |
| 9  | 1H    | Q11      | 3.29         | 5         | 66     | 3.29                                                       | 4.54         | 3.98         | 3.53         | 3.04         | 2.31         | 1.87         | 1.16        | 0.65        |
| 10 | 2H    | Q14a     | 1.91         | 3         | 64     | 1.91                                                       | 2.89         | 2.61         | 2.10         | 1.66         | 1.06         | 0.46         | 0.30        | 0.03        |
| 11 | 2H    | Q13      | 1.88         | 3         | 63     | 1.88                                                       | 2.77         | 2.44         | 2.01         | 1.61         | 1.19         | 0.83         | 0.27        | 0.20        |
| 12 | 1H    | Q15      | 1.77         | 3         | 59     | 1.77                                                       | 2.92         | 2.59         | 1.98         | 1.36         | 0.66         | 0.22         | 0.11        | 0.00        |
| 13 | 1H    | Q08      | 1.36         | 3         | 45     | 1.36                                                       | 2.51         | 1.84         | 1.41         | 0.89         | 0.40         | 0.25         | 0.05        | 0.00        |
| 14 | 2H    | Q10      | 1.41         | 3         | 47     | 1.41                                                       | 2.55         | 1.94         | 1.39         | 0.92         | 0.53         | 0.29         | 0.08        | 0.01        |
| 15 | 1H    | Q03      | 1.63         | 4         | 41     | 1.63                                                       | 3.01         | 2.08         | 1.73         | 1.09         | 0.67         | 0.26         | 0.05        | 0.00        |
| 16 | 1H    | Q16      | 2.23         | 5         | 45     | 2.23                                                       | 4.48         | 3.53         | 1.84         | 1.04         | 0.41         | 0.09         | 0.03        | 0.08        |
| 17 | 2H    | Q15      | 2.10         | 6         | 35     | 2.10                                                       | 4.08         | 3.09         | 2.09         | 1.20         | 0.39         | 0.14         | 0.04        | 0.01        |
| 18 | 1H    | Q20      | 1.24         | 3         | 41     | 1.24                                                       | 2.70         | 1.95         | 0.97         | 0.40         | 0.10         | 0.02         | 0.00        | 0.00        |
| 19 | 2H    | Q22      | 1.45         | 6         | 24     | 1.45                                                       | 3.53         | 1.89         | 0.93         | 0.49         | 0.18         | 0.04         | 0.00        | 0.00        |
|    |       |          | <b>47.18</b> | <b>80</b> |        | <b>47.18</b>                                               | <b>70.85</b> | <b>60.93</b> | <b>50.88</b> | <b>40.66</b> | <b>28.57</b> | <b>18.28</b> | <b>9.51</b> | <b>3.94</b> |

### Suggested grade boundaries

| Grade | 9  | 8  | 7  | 6  | 5  | 4  | 3 |
|-------|----|----|----|----|----|----|---|
| Mark  | 71 | 66 | 55 | 35 | 23 | 14 | 7 |