# Ratios Past Paper Answers GCSE OCR - Calculator

## 1.

| 1 | (a) | 27[.00] | 2 | **M1** for 45 × 0.6 oe or 45/5 or 9 | Condone 27.0, 27.00p |
|---|-----|---------|---|-------------------------------------|----------------------|
| | (b) | 3 : 8 or 0.375 oe : 1 or 1:2.6̇ or exact equivalent mark final answer | 2 | **M1** for 6 : 16 or 1 : 2.6-2.7 or correct answer seen then spoiled<br>After 0 scored allow **SC1** for correct ratio but reversed e.g. 8:3 | Condone £3 : £8 for **1** or **2** marks |

## 2.

| Question | | Answer | Marks | Guidance | |
|----------|---|--------|-------|----------|---|
| 1 | (a) | 2000 [g] or 0.75 [kg] seen | M1 | May be implied by eg $\frac{1}{8}$ of blackberries = 250 [g] | NB answer 8 : 3 given, mark the method |
| | | Interim step in simplification of 2000 : 750 or 2 : 0.75 leading to 8 : 3 | M1 dep | Or multiplier method<br>eg 8/2 = 4 and 3 ÷ 4 = 0.75<br>Or 2000/8 = 250 and 750/3 = 250<br>Or 2000/250 = 8 and 750/250 = 3<br><br>Or 2000/750 = 8/3 [so 8 : 3] for **M1**<br>(bod using fraction button on calc) | Similarly allow **M1** for 2/0.75 = 8/3<br><br>Condone all reversed. leading to 3 : 8<br>Condone starting with 8 : 3 and getting to 2000 : 750 or 2 : 0.75 |

## 3.

| | (a) | (i) | 45 | 2 | **M1** for $\frac{5}{8} \times 72$ oe or $\frac{5}{their(1+2+5)} \times 72$<br>oe or for [1 share =] 9<br>or for 9 : 18 : 45 as answer | |
|---|-----|-----|----|----|----|---|

| Question | | Answer | Marks | Part Marks and Guidance | |
|----------|---|--------|-------|-------------------------|---|
| | (ii) | 1440 | 2 | **M1** for $\frac{8}{2} \times 360$ oe or for [1 share =] £180 | |
| | (b) | 59.33 to 59.34 or 59.3(0) | 4 | **M1** for midpoints 10, 30, 50 etc seen or used<br><br>**M1** for *their* midpoints × freq (20, 150, 350, 770, 270, 220; total 1780)<br><br>**M1** for (*their* sum of midpoints × freq) ÷ 30<br><br>Allow **A1** for 59 if **M3** earned | At least three of them seen; may be implied by products<br>Allow 9.99, 29.99, 49.99 etc<br><br>At least 3 correct or total seen Accept 19.98, 149.95, 349.93, 769.89, 269.97, 219.98; total 1779.7<br><br>Allow first two **M1**s if seen even if another method used for answer on answer line<br><br>Second and third Ms are available for '*their* midpoints' being an attempt using other points in interval, or endpoints (at least 3 seen)<br><br>Allow **M0M0M1** for 600/30 following consistent use of class-width 20 instead of midpoints<br><br>Answers of 69.33 to 69.34 or 69.3(0) (or 49.33 to 49.34 or 49.3(0)) imply second and third **M1**s |

**4.**

| Question | Answer | Marks | Part marks and guidance | |
|---|---|---|---|---|
| | $180 \div 10$ | M1 | or eg $\frac{2}{10} \times 180$ seen oe for at least one angle | |
| | Angles 36, 54, 90 | A1 | or **B2** | |
| | 6 used as hypotenuse of right-angled triangle (may be implied by sketch or attempt at trig with 6 as hyp) | M1 | if this and subsequent M marks not earned, allow SC1 for the strategy of any attempt at using trig | allow this second M1 for accurate drawing |
| | Use of sine *their* 36 (attempt at right-angled trig or sine rule) or of cos *their* 54 | M1 | | or equivalent methods to find other side and then correct use of Pythagoras |
| | $6 \times \sin 36$ or $6 \times \cos 54$ oe | M1 | For this last **M1**, must work with correct angles | Condone poor notation e.g. sin (36 × 6) for this last **M1** |
| | 3.5(267...) rot to 2 sf or more | A1 | After marks for angles; Allow **B4** for 3.5(267...) rot to 3 sf or more ( need not be identified as shortest side).  If 3.5(267...) not found, allow **SC2** for 4.8(541...) rot to 3 sf or more | or **SC2** for 4.8 or 4.9 after correct use of trig |
| | Showing *their* answer : $6 \neq 2 : 5$ or obtaining for sides to be in same ratio, shortest side should be 2.4 | B1 | accept using 3.5 to 3.53 from correct answer but not approximation to 4 (oe FT *their* shortest side found)<br><br>B0 for just '3.5 : 4.9 : 6 is not the same as 2 : 3 : 5' | using 3.5, 4.9 and 6 may eg work out perimeter and divide 14.4 in ratio 2:3:5 as 2.88: 4.32 :7.2;<br><br>allow B1 for 2.4 : 3.6 : 6 seen<br><br>NB in the absence of clear evidence of trigonometry used, the max mark is M1A1M1M0M0A0B1 |

**5.**

| | | | | |
|---|---|---|---|---|
| (a) | 26 | 2 | **M1** for $325 \div (23 + 2)$ oe or for 13 | Condone 299 : 26 for two marks |
| (b) | Use of tan | M1 | Even if used wrongly | Allow **M1** for use of tan (or tan⁻¹ oe) anywhere in the question |
| | (Height at end of first stage) = 8.6(08...) | A1 | Accept 8.5 to 8.61 even if then used in wrong position on diagram; if not seen, may be implied by further correct working | Throughout question allow complete equivalent methods using Pythagoras and sin and cos |
| | 12.7 – *their* 8.6(08...) or 4.09 to 4.2 or FT | M1 | | |
| | $[x =]\tan^{-1}\left(\dfrac{their\,4.09...}{35}\right)$ | M1 | Dep on 2ⁿᵈ **M1**; condone poor notation | **M0** for just $\tan[x] = \left(\dfrac{their\,4.09...}{35}\right)$ |
| | 6.6 to 6.843 or 7 | B1 | This final mark may still be gained if eg sin⁻¹ used or scale drawing | but **M1** if their answer following this implies they have used invtan |

**6.**

| Question | | Answer | Marks | Part Marks and Guidance | |
|---|---|---|---|---|---|
| **(a)** | | 13 : 15 | 3 | Or $\frac{13}{15}$ : 15 or $0.8\dot{6}$ : 1 or 1 : $\frac{15}{13}$ or <br><br> 1 : $1.15384\dot{6}$ <br><br> **M1** for correct conversion of m to cm or vv <br><br> **M1FT** for correct partial simplification of *their* ratio <br><br> Allow **M2** for 13 cm to 15 cm or 15 : 13 or <br><br> 13 : 1500 or rot versions of $0.8\dot{6}$ : 1 or <br><br> 1 : $1.15384\dot{6}$, if exact answer is not seen | **M2** for 78 : 90 or 52 : 60 or <br> 39 : 45 or 26 : 30 or 0.78 : 0.9 etc <br><br><br> Condone inclusion of units for the Ms <br><br> 2<sup>nd</sup> **M1** may be gained if conversion is not attempted <br><br> 0.13 m : 15 cm gets **M0M1** <br> 1.15 : 1 gets **M1** |
| **(b)** | | Sarah 2220 and <br> David 1480 | 3 | **B2** for one correct or for answers reversed <br> Or **M1** for 3700 ÷ 5 or 740 | |

**7.**

| Question | | | Answer | Marks | Part marks and guidance | |
|---|---|---|---|---|---|---|
| 1 | **(a)** | | 16 | 2 | **M1** for 24/3 or for 8 or for 8 × 3 = 24 | Common with Foundation |
| | **(b)** | | C 15 600 <br> H 10 400 | 3 | **B2** for one correct on answer line <br> or for 15 600 and 10 400 seen <br><br> Or **B1** for 15 600 or 10 400 seen <br><br> Or **M1** for 26 000/ *their*(3 + 2) or for 5200 <br><br> Condone answers reversed on answer line if clearly correct in body of script with correct person (treat as transfer error) | Common with Foundation |

**8.**

| Question | | Answer | Marks | Part Marks and Guidance | |
|---|---|---|---|---|---|
| **(a)** | | Samira 420 and Joanne 280 | 3 | **B2** for one of these correct <br> or **M1** for 700 ÷ 5 or 140 <br><br> **SC2** for answers reversed | |
| **(b)** | | 210 | 3 | **M2** for 5/2 × 84 oe <br> or **M1** for 84 ÷ 2 or 42 or for 126 found | e.g. M2 for 84 + 42 × 3 or 84 + 126 |

**9.**

| Question | | Answer | Marks | Part Marks and Guidance |
|---|---|---|---|---|
| (a) | | 241.6 to 241.7 or 240, 241 or 242 | 2 | **M1** for $\frac{100}{60} \times 145$ oe or for [1g =] 2.4(16...) or 10g = 24. (16...) <br> or **B1** for answer with digits 2416(...) or 2417 with wrong dp |
| (b) | | 165 to 167 or 170 | 2 | **M1** for $\frac{400}{145} \times 60$ oe or $\frac{400}{their\ (a)} \times 100$ oe <br><br> If 0 , allow SC1 for <br> $\frac{145}{60} \times$ acceptable answer = result in range 398 to 411 |
| (c) | | $[1:]\frac{29}{12}$ | 2 | allow $[1:]2\frac{5}{12}$ <br><br> **M1** for 12 : 29 or $\frac{12}{29}$ : 1 or for $[1:]\frac{145}{60}$ or for $[1:]2\frac{25}{60}$ |

**10.**

| (a) | 5 : 6 | 2 | Accept 1 : 1.2 or 0.83(3...) : 1 or better <br> **M1** for a correct simplification of 40 : 48 <br> e.g. 10 : 12 |
|---|---|---|---|
| (b) | Sonja 80 and Ben 60 | 2 | **M1** for 140 ÷ 7 or 20 <br> Or **SC1** for S 60 B 80 |

**11.**

| (a) | (i) 280 | 2 | **M1** for 140 or for 420 ÷ 3 | |
|---|---|---|---|---|
| | (ii) 540 | 2 | **M1** for 180 or for 360 ÷ 2 | |
| (b) | 13 : 8 or 13/8 : 1 oe or 1 : 8/13 as final answer | 2 | **M1** for 26 : 16 or 130: 80 or 13g : 8g or other correct partial simplification or for 13 and 8 seen | Allow **2** marks for 1.625 : 1 or 1 : 0.615(...) <br> Allow **M1** for 1.62 : 1 or 1.63 : 1 or 1 : 0.61 or 1 : 0.62 |

**12.**

| Question | | Answer | Marks | Part Marks and Guidance | |
|---|---|---|---|---|---|
| (a) | (i) | <table><tr><td></td><td>21</td></tr><tr><td>37</td><td></td></tr><tr><td>77</td><td>53</td></tr></table> | 3 | **B2** for two correct entries <br> Or **B1** for one correct entry | If a space is blank, accept clear evidence in working space eg Joe White = 21 |
| | (ii) | 8 : 7 | 1 | Accept 1 : 0.875 or 1.14[...] : 1 | |
| (b) | | 12 | 3 | nfww <br> **M2** for $\frac{60}{their\ (7 + 5 + 3)} \times 3$ oe <br> Or **M1** for 60 ÷ their (7 + 5 + 3) oe or for 4 | |

**13.**

| Question | Answer | Marks | Part Marks and Guidance |
|---|---|---|---|
| (a) | 1: 1.4 or 1:$\frac{7}{5}$ or 1:$1\frac{2}{5}$ | 1 | |
| (b) | 7 : 15 or 1:$\frac{15}{7}$ oe | 3 | Must be without 'minutes' <br><br> **M1** for 56 : 120 soi <br> AND <br> **M1** for correct partial simplification eg 28 : 60 <br><br> Or **SC1** for 7 : 25 oe |

**14.**

| | | Answer | Marks | Part Marks and Guidance | |
|---|---|---|---|---|---|
| (a) | (i) | 9 | 2 | **B1** for 8 shares seen or used eg 24 ÷ 8 [= 3] <br> or **B1** for 3 × 3 | B0 for just 3 seen <br><br> [Common with Foundation] |
| | (ii) | 10 | 2 | **B1** for 5 × 2 or other clear evidence of attempt to double the ratio | [Common with Foundation] |
| (b) | | 2.20 pm or 14:20 | 3 | **B2** for 80 or **1h 20m** or 2:20 <br> or **M1** for prime factor decomposition of 16 and/or 20 found <br> 16 = $2^4$, 20 = $2^2$ × 5 but need not be expressed as product <br> or **M1** for 16, 32, 48 and 20, 40, 60 seen (oe in counting on from 1 pm) <br> or **M1** for 16 = 4 × 4 and 20 = 4 × 5 | eg correct factor tree or division list <br><br> [Common with Foundation] |

**15.**

| (a) | 32  128 | 2 | Allow **M1** for 160/5 |
|---|---|---|---|
| (b) | 4800 | 3 | Or **M2** for 600/2 × 16 <br> Or **M1** for anything × 16 |