



GCSE MARKING SCHEME

AUTUMN 2022

GCSE MATHEMATICS – COMPONENT 2 (FOUNDATION TIER) C300U20-1

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INTRODUCTION

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

EDUQAS GCSE MATHEMATICS

AUTUMN 2022 MARK SCHEME

| Component 2: Foundation Tier | Mark | Comment |
|---|----------|---|
| 1.(a) (£) 35.25 | B1 | |
| 3 (sets of spades) | B1 | |
| (£) 16.15 | B1 | |
| (Total = £) 63.7(0) | B1 | FT their values in the table |
| | | Allow £63.70p |
| 1.(b) (£) 6.37 ISW | B1 | FT 'their 63.70' from (a) |
| | | |
| 1.(c) | | |
| 6 (Beach balls) | B2 | Allow for e.g. |
| | DZ | |
| | | 'She can buy 4 and get 2 free.' 'Two lots of 3 balls.' |
| | | |
| | | |
| | | B1 for sight of (\pounds) 12.8(0) |
| | | OR 4 (balls), may be embedded |
| | | OR 15 ÷ 3.2(0) (= 4.6875) |
| | | OR £6.40 for three balls |
| | | |
| | (7) | |
| | | |
| | <u> </u> | |
| 2.(a) Three hundred and forty thousand, two | B1 | Do not penalise incorrect spelling. |
| hundred and five | | |
| | | |
| 2.(b) Any 6 small triangles shaded | B1 | |
| | | |
| 2.(c) 2/10 circled | B1 | |
| | | |
| 2.(d) -5 -3 3.45 3.6 6 | B1 | |
| | B1 | |
| 2.(e)(i) 7543 | Ы | |
| 2.(e)(ii) 3574 | B1 | |
| 2.(e)(ii) 3574 | | |
| | (6) | |
| | (0) | |
| | | |
| 3.(a) 270(g) and 350(g) | B1 | |
| | | |
| 3.(b) | 1 | |
| (Pear 270 ÷ 3 =) 90 (g) | B1 | FT 'their 270' |
| $(350 - 90) \div 2$ | M1 | FT 'their derived 90' and 'their 350' from (a) |
| (Banana) 130(g) | A1 | FT |
| | ,,,, | |
| | | |
| | (4) | |
| 4.(a)(i) | . , | |
| unlikely | B1 | |
| 4.(a)(ii) | 1 | |
| An even chance | B1 | |
| | | |
| 4.(b) | | |
| | B1 | Allow 3/12 oe and 11/12 oe as labels. |
| | B1 | |
| U 1 | B1 | |
| | (5) | |
| | | |

| 5. D and E | B1 | |
|--|----------|---|
| B | B1 | |
| A and H | B1 | |
| C and G | B1 | |
| | | |
| | (4) | |
| 6.(a) | DO | D4 for 4 44 on 4 44 on for user lie a to coloulate the |
| 1 (hour) 44 (minutes) or 104 (minutes) | B2 | B1 for 1.44 or 1:44 or for working to calculate the time from 08:45 to 10:29. |
| | | |
| | | |
| 6.(b) 08:47 | B2 | Any clear indication; may be identified in the |
| | | table. |
| | | Allow for 8:47 OR 08:47 to 09:18 OR |
| | | 08:47 – 09:18. |
| | | B1 for sight of (09:18 + 15 minutes =) 09:33 |
| | | or $(09:48 + 15 \text{ minutes} =) 10:03$ |
| | | or $(10:00 - 15 \text{ minutes} =) 09:45$ |
| | | or (10:00 – 09:48 =) 12 (minutes) |
| | | or 08:15 (identifying the correct train) |
| | | |
| | (4) | |
| 7.(a)(i) 53 (pounds) | B1 | Allow 52.66 to 53 inclusive (pounds) |
| | ы | Allow 52.00 to 55 inclusive (pounds) |
| 7.(a)(ii) | | |
| 6 (kg) | B1 | Allow 5.7 to 6 inclusive (kg) |
| | N 4 4 | |
| 7.(b)(i) 11.25 x 8 + 95 (€)185 | M1 A1 | May be seen in stages |
| (2)185 | | |
| 7.(b)(ii) | | |
| (270 – 126) ÷ 11.25 | M2 | May be seen in stages |
| | | M2 may be implied by each of the following: |
| | | 444 44.05 |
| | | • 144 ÷ 11.25 |
| | | 126 + 11.25 × 12 = 261 126 + 11.25 × 12 AND 126 + 11.25 × 13 |
| | | • $126 + 11.25 \times 12$ AND $126 + 11.25 \times 13$ • $270 - 126 = 144$ with $11.25 \times 12 = 135$ |
| | | • $270 - 120 = 144$ with $11.23 \times 12 = 133$ |
| | | M1 for 126 + 11.25 \times <i>n</i> where <i>n</i> > 1 or |
| | | M1 for $270 - 126$ (= 144) |
| | | M1 for $270 - 126 \div 11.25$ (= 258.8) |
| | | |
| 12 | A1 | CAO |
| | | An answer of 12.8 implies M2.40 |
| | | An answer of 12.8 implies M2 A0 Award zero marks for an unsupported answer of |
| | | |
| | | |
| | L | |
| | (7) | |
| | <u> </u> | |

| 8. (Swimming) | | |
|--|-----|---|
| 2/3 x (320 + 7.25 x 5) or (320 + 7.25 x 5) – 1/3 x (320 + 7.25 x 5) | M2 | May be seen in stages Award M1 for one of the following: • 320 + 7.25 x 5 (= 356.25) • 1/3 x (320 + 7.25 x 5) (= 118.75) • 2/3 x 'their total cost' |
| (£)237.5(0) | A1 | CAO If units are given, they must be correct. |
| (Adventure centre) | | |
| 0.85 x 13.6(0) x 25 or 13.6(0) x 25 – 0.15 x 13.6(0) x 25 | M2 | May be seen in stages Award M1 for one of the following: • 13.6(0) × 25 (= 340) or • 0.15 × 13.6(0) × 25 (= 51) or • 0.85 × 13.6(0) × n where n ≥ 1 |
| (£)289 | A1 | CAO If units are given, they must be correct. |
| (Malik's choice) Swimming party clearly indicated | B1 | STRICT FT provided at least M1 previously awarded and a total cost for each party is found. |
| | (7) | |

| 9. The five correct numbers listed 21, 22, 23, 29, 29 | B4 | Check the conditions carefully if the numbers are not listed in ascending order B1 for each of the following: The median of five numbers is 23. The mode is 29 The difference between the smallest and largest numbers is 8 If the boxes are used, they take precedence (unless clearly replaced). |
|---|----------|--|
| 124 (miles) | B1 | FT from B2 or B3 provided five numbers are used |
| | (5) | |
| 10.(a) A valid explanation e.g. 'company B might have more employees than company A' 'we don't know how many employees there are in each company' 'company A may have a bigger proportion of female employees, but it may have less employees overall' | E1 | Allow e.g. 'one company might be smaller than the other' 'there are no numbers given so we can't be certain A has more than B' 'does not show the number of males or females' 'they only show the proportion of staff, not the number of staff' 'the number (of staff) in the two companies could be different' Do not allow e.g. 'there are no numbers given' |
| 10.(b) 30(%) or 65(%) (difference) 35 (%) | B2 B1 | B1 for 108/360 (x100) or 234/360 (x100) |
| Alternative method (234 – 108) / 360 (x 100) 35(%) | M2 A1 | M1 for 234 – 108 (= 126) |
| | (4) | |
| 11. Calculations that allow comparison e.g. (100g) 2.21/5 AND 3.78/9 | M1 | e.g. (4500g) 2.21 × 9 AND 3.78 × 5 |
| =(£)0.44(2) =(£)0.42 AND 900g indicated | A1 | $=(\pounds)19.89 = (\pounds)18.90$ AND 900g indicated If units are given, they must be correct. Note: 900g 2.26 0.442 900g 2.38 0.42 |
| | (2) | |

| 12.(a) 5a | B1 | |
|--|----------------|---|
| 12.(b) 4x = 2 + 5 or 4x = 7 x = 1.75 or 7/4 or 1 ³ ⁄ ₄ ISW | B1 B1 | FT equation in the form $4x = a$. Accept $\frac{a}{4}$ but if on FT it simplifies to an integer the answer must be given as an integer. Allow an embedded answer. Maximum of 1 mark if the answer is not fully |
| 12.(c) 7g - 42 | B1 | correct. Mark final answer. |
| 12.(d) 2(3x + 2) | B1 | |
| 12.(e)(i) $8x + 8x + 8x + 8x$ or $8x \times 4$ = 32x | M1 A1 | |
| 12.(e)(ii) 8x × 8x or $(8x)^2$ = $64x^2$ | M1 A1 | M0 for 8x ² If no marks in (e)(i) and (e)(ii) award SC2 for answers of 64x ² in (i) AND 32x in (ii). |
| | (9) | |
| 13.(a) All values correct (9) 18 27 36 4 8 12 (16) (1) 2 3 4 | B2 | B1 for at least 5 correct values |
| 13.(b) (chance of winning) 5/12 si 108 ÷ 12 × 5 45 (times) | B1 M1 A1 | FT 'their completed table' FT 'their 5' or 'their probability' FT provided it is a whole number 45/108 is awarded B1 M1 A0 |
| | (5) | |
| 14.(a) (speed =) 31.5 ÷ 1.75 | M1 | Allow 31.5 ÷ 1.45 (= 21.7) or 31.5 ÷ 105 (= 0.3) for M1 |
| 18 (km/h) | A1 | CAO |
| 14.(b) 31.5 ÷ 15 | M1 | |
| 2 (hours) 6 (mins) or 126 (mins) si | A2 | A1 for 2.1 (hours) A0 for 2 hours 10 minutes or 130 minutes alone |
| 6:06p.m. or 18:06 | B1 | Allow for 6:06 but not for 6:06 a.m. FT 'their 2 hours 6 minutes' or 'their 126 minutes' provided M1 awarded including answers of 6:10 p.m. or 18:10. |
| 15. (x =) 42 | (6) B1 | |
| (y =) (180 – 152) ÷ 2 | M1 | |
| = 14 | A1 | |
| | (3) | |

| If no marks, award SC1 for an answer of 16-7 or 31-2 (from $\sqrt{1456} + 1.3^3 - 0.7$ and $\sqrt{1456} + 1.3^2 - 0.7$)17. (volume =) 25 x 40 x 32 = 32000 (cm ²)M1 A1May be seen in stages.32000 + 2000 OR 32 + 2M1 RMay be seen in stages.TT 'their 32000' m1 for the appropriate division with a place value error from an incorrect conversion e.g. 32000 + 20 00 320 + 2.T' their 32000' m1 for the appropriate division with a place value error from an incorrect conversion e.g. 32000 + 20 00 320 + 2.16 (times)A1FT provided M1 m1 awarded18. '(a)(i) 5 12B1ISW18. '(a)(i) 18. '(a)(i) 22. 7 12FT their 2 + 3 + 7' from (a)(i) provided > 1018. (a)(ii) 32. (x100) or 2.5 (x 100)M1 430250(%)A1FT their 2 + 3 + 7' from (a)(i) provided > 1019. (a) (650 x 8 + 750 x 7 + 850 x 4 + 950 x 11) 430M1 A1(a) (b) Valid comment e.g. Her answer will be an underestimate.' She is using the lowest values so the mean will be too small'.E1 Allow answers that state that the calculated mean will be too small'.19. (b) Valid comment e.g. Her answer will be an underestimate.' She is using the lowest values so the mean will be too small'.E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the entire range.' Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. She has used the smallest value in each group.' Because thes values are the lowest bounds.' Because the is using the miniponits.' It is better to use the midponits.' It is bett | 16. 25.5 | B2 | B1 for 25·4(8) or 25·50 |
|---|--|-----|---|
| $31-2$ (from $\sqrt{(1456)} + 1.3^3 - 0.7$ and $\sqrt{(1456)} + 1.3^3 - 0.7$ bigeneric and $\sqrt{(16)} + 1$ | | | |
| and \cdot (1456 + (1.3 ³ - 0.7))(2)17. (volume =) 25 × 40 × 32 = 32000 (cm ³)A1A1A1A1A1A1A1A1A1A1A1A1A1A2A2A1A1A1A1A1A2A2A2A2A2A3A3A4A4A4A4A4B4< | | | |
| (2)(2)17. (volume =) 25 x 40 x 32 = 32000 (cm³)M1 A1May be seen in stages.32000 + 2000 OR 32 + 2M1 A1M232000 + 2000 OR 32 + 2M2FT 'their 32000' m1 for the appropriate division with a place value err from an incorrect conversion e.g. 32000 + 20 or 320 + 2. Allow m1 A0 for 'their 25 x 40 x 32' + 2.16 (times)A1FT provided M1 m1 awarded55B1ISW18. (a)(i)5B118. (a)(i)5B118. (a)(i)5FT 'their 2 + 3 + 7' from (a)(i) provided > 1018. (a)(i)65FT 'their 2 + 3 + 7' from (a)(i) provided > 1018. (b)M1FT 'their 2 + 3 + 7' from (a)(i) provided > 1019. (b)650 x 8 + 750 x 7 + 850 x 4 + 950 x 11) x 30M1(c)(c)M191. (a) (grams)A119. (b)Yald comment e.g. Her answer will be an underestimate.' She is using the lowest values so the mean will be too small'.E1Allow answers that state that the calculated mean will be too small'.E1Allow answers the groups, e.g. 'Her method will give a smaller mean.' Because the groups, e.g. 'She has used the smaller value in each group.' Because the subset values as the interval.' 'Because the subset values as the mean will be an unfair estimate.' Do not allow e.g. 'She has used the smaller value in each group.' 'Because the subset values in each group.' 'Because the subset values in each group.' 'Because the is not as accurate as the midpoints.' 'It is better to use the midpoints.' | | | $(\text{from }\sqrt{(1456)} \div 1.3^3 - 0.7)$ |
| 17. (volume =) $25 \times 40 \times 32$ = $32000 (cm^3)$ M1 A1May be seen in stages.32000 $\pm 2000 \text{ OR } 32 \pm 2$ M1 A1May be seen in stages.32000 $\pm 2000 \text{ OR } 32 \pm 2$ M2FT 'their $32000'$ m1 for the appropriate division with a place value error from an incorrect conversion $e_3 - 2000 + 320 + 32$.16 (times)A1FT provided M1 m1 awarded $\frac{5}{12}$ B1ISW18.*(a)(i)5FT 'their $2 + 3 + 7'$ from (a)(i) provided > 1018.*(a)(ii)FT 'their $2 + 3 + 7'$ from (a)(i) provided > 1018.(b)M1FT 'their $2 + 3 + 7'$ from (a)(i) provided > 1018.(b)M1FT 'their $2 + 3 + 7'$ from (a)(i) provided > 1019.(b)M1A1250(%)M1M141f on marks, award SC1 for an answer of 150(%) (using a profit of £48)19.(b) 430 m141f on tarks, award SC1 for an answer of 150(%) (using a profit of £48)19.(b) 430 m141Halow answers that state that the calculated mean will be an underestimate.' Because the evalues do not represent the entire range.'810 (grams)A1E1Allow answers that state that the lowest values do not represent the group, e.g. 'Her method will give a smaller mean.' Because the suight minimum masses making at an undar estimate.' 'Because the suight the entire range.'' Because the suight the entire walking at an undare stimate.'' 'Because the suight the invert buoks.' 'Because the suight the entire walking at an undare stimate.'' '''' '''''''''''''''''''' '''''''''''''''' | | (2) | and √(1456 ÷ (1.3³ - 0.7)) |
| = 32000 (cm ³) A1 32000 ÷ 2000 OR 32 ÷ 2 m2 FT 'their 32000' m1 for the appropriate division with a place value error from an incorrect conversion e.g. 32000 ÷ 200 or 320 ÷ 2. Allow m1 A0 for 'their 25 × 40 × 32' ÷ 2. 16 (times) A1 FT provided M1 m1 awarded (5) 18.*(a)(i) 5 12 18.(a)(i) 5 12 18.(a)(i) 5 12 18.(a)(i) 18.(a)(i) 18.(b) 18.(b) 19.022 22.04.00 or 2.5 (x 100) 23.(v100) or 2.5 (x 100) 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) 19.*(a) (b) (c) (c) <td< td=""><td>17. (volume =) 25 × 40 × 32</td><td></td><td>May be seen in stages.</td></td<> | 17. (volume =) 25 × 40 × 32 | | May be seen in stages. |
| If or the appropriate division with a place value error from an incorrect conversion e.g. 32000 + 200 or 320 + 2. Allow m1 A0 for their 25 × 40 × 32' \pm 2.16 (times)A117 Frovided M1 m1 awarded18.*(a)(i)518.*(a)(i)51218.(a)(ii)19.72 × 71119.72 × 71119.72 × 71119.72 × 71119.73 × 71119.74 × 719.74 × 719.75 × 7 + 850 × 4 + 950 × 11) $\Rightarrow 30$ $\Rightarrow 10$ $\Rightarrow 10$ 19.7(a)(650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) $\Rightarrow 30$ $\Rightarrow 10$ $\Rightarrow 10$ 19.(b)Valid comment e.g.Her answer will be an underestimate.' She is using the lowest values so the mean will be too small'.19.(b)Valid comment e.g.Her method will give a smaller remain.' Because these values a on terpersent the entire range.' Because these values a on terpersent the entire range.' Because these values a the lowest values 'Because these values are the lowest barry.' 'Because these values are the lowest on terpersent the entire range.' 'Because these values in each group.' 'Because these values in each group.' 'Because the sub the lowest barry.' 'Because the sub the lowest barry.' 'Because the lowest barry.' 'Because these values are the lowest barry.' 'Because these values are the lowest barry.' 'Because the sub the lowest barry.' 'Because the serve a the lowest barry.' 'Because the serve a the lowest barry.' 'Because the lowest barry.' 'Because t | | A1 | |
| 18.*(a)(i)(5) $\frac{5}{12}$ B1ISW18.(a)(ii)B1ISW18.(a)(ii)M1FT 'their 2 + 3 + 7' from (a)(i) provided > 10(b)10542A1A118.(b)M1A118.(b)M1A120.(<100) or 2.5 (x 100) | 32000 ÷ 2000 OR 32 ÷ 2 | m2 | m1 for the appropriate division with a place value error from an incorrect conversion e.g. 32000 ÷ 200 or 320 ÷ 2. |
| 18.*(a)(i) B1 ISW 18.(a)(ii) 18.(a)(ii) FT 'their 2 + 3 + 7' from (a)(i) provided > 10 12.7 A1 FT 'their 2 + 3 + 7' from (a)(i) provided > 10 18.(b) A1 FT 'their 2 + 3 + 7' from (a)(i) provided > 10 80 (x100) or 2.5 (x 100) M1 250(%) A1 Mark final answer 19.*(a) (5) (5) 19.*(a) (5) M1 650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 (= 24300) 19.*(a) (5) M1 810 (grams) A1 M1 Her answer will be an underestimate.' She is using the lowest values so the mean will be smaller or indicate that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. Yher method will give a smaller mean.' 'Because these values do not represent the entire range.' Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because the is using the minimum masses making at an unfair estimate.' 'Do not allow e.g.<''She has used the smallest value in each group.'' | 16 (times) | A1 | FT provided M1 m1 awarded |
| $\frac{5}{12}$ B1ISW18.(a)(ii) (18.(a)(ii) 12.7 $\frac{102}{12} \times 7$ M1FT 'their 2 + 3 + 7' from (a)(i) provided > 10(£)10542A118.(b) $\frac{80}{32} (\times 100) \text{ or } 2.5 (\times 100)$ M1250(%)A1M1Fr omarks, award SC1 for an answer of 150(%) (using a profit of £48)(65)(5)19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) | | (5) | |
| 18.(a)(ii) M1 FT 'their 2 + 3 + 7' from (a)(i) provided > 10 18.(a)(ii) A1 18.(b) A1 18.(b) A1 80 (x100) or 2.5 (x 100) 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) $\div 30$ M1 810 (grams) A1 810 (grams) A1 810 (grams) A1 92.(b) Valid comment e.g. 'Her answer will be an underestimate.' E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Because these values do not represent the entire range.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' ''t is better to use the midpoints.' | 18.*(a)(i) | | |
| 18.(a)(ii) M1 FT 'their 2 + 3 + 7' from (a)(i) provided > 10 18.(a)(ii) A1 18.(b) A1 18.(b) A1 80 (x100) or 2.5 (x 100) 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) $\div 30$ M1 810 (grams) A1 810 (grams) A1 810 (grams) A1 92.(b) Valid comment e.g. 'Her answer will be an underestimate.' E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Because these values do not represent the entire range.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' ''t is better to use the midpoints.' | $\frac{5}{12}$ | B1 | ISW |
| (£)10542 A1 18.(b) M1 80/2 (×100) or 2.5 (× 100) M1 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) 19.*(a) (5) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 ÷ 30 m1 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' F1 She is using the lowest values so the mean will be too small'. E1 Allow answers that state that the calculated mean will be too small'. "Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because the values are the lowest bounds.' 'Because the so accurate as the midpoints.' 'It is better to use the midpoints.' 'It is better to use the midpoints.' | 18.(a)(ii) | | |
| (£)10542 A1 18.(b) M1 80/2 (×100) or 2.5 (× 100) M1 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) 19.*(a) (5) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 ÷ 30 m1 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' F1 She is using the lowest values so the mean will be too small'. E1 Allow answers that state that the calculated mean will be too small'. "Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because the values are the lowest bounds.' 'Because the so accurate as the midpoints.' 'It is better to use the midpoints.' 'It is better to use the midpoints.' | <u>18072</u> ×7 | M1 | FT 'their 2 + 3 + 7' from (a)(i) provided > 10 |
| 18.(b) M1 80/32 (×100) or 2.5 (× 100) M1 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) ÷ 30 m1 810 (grams) 41 19.(b) Valid comment e.g. 'Her answer will be an underestimate.' 'She is using the lowest values so the mean will be smaller or indicate that the calculated mean will be too small'. 'Because these values do not represent the entire range.' 'Because the groups, e.g. 'Her method will give a smaller mean.' 'Because she is using the minimum masses making at an unfair estimate.' 'Do not allow e.g. 'She has used the smallest value in each group.' 'Because the subs are the lowest bounds.' 'Because the is not as accurate as the midpoints.' 'It is better to use the midpoints.' | | Δ1 | |
| 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) 19.*(a) (5) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 ÷ 30 m1 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' E1 She is using the lowest values so the mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because the smallest value in each group.' 'Because the smallest value in each group.' 'Because the midpoints.' 'It is better to use the midpoints.' | 18.(b) | | |
| 250(%) A1 Mark final answer If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) 19.*(a) (5) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 ÷ 30 m1 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' E1 She is using the lowest values so the mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because the smallest value in each group.' 'Because the smallest value in each group.' 'Because the midpoints.' 'It is better to use the midpoints.' | 80 | M1 | |
| If no marks, award SC1 for an answer of 150(%) (using a profit of £48) (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) + 30 m1 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' 'She is using the lowest values so the mean will be too small'. E1 Allow answers that state that the calculated mean will be too small'. 'Because these values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because these values do not represent the entire range.' 'Because these values are the lowest bounds.' 'Because the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because these values are the indipoints.' 'It is better | | A1 | Mark final answer |
| (using a profit of £48) (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) ÷ 30 m1 ÷ 30 M1 (= 24300) m1 * 30 M1 (state of the state of t | | | |
| (5) 19.*(a) (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) ÷ 30 m1 ÷ 30 810 (grams) A1 19.(b) Valid comment e.g. 'Her answer will be an underestimate.' She is using the lowest values so the mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' 'It is better to use the midpoints.' | | | |
| (650 × 8 + 750 × 7 + 850 × 4 + 950 × 11) M1 (= 24300) ÷ 30 m1 A1 19.(b) Valid comment e.g. A1 'Her answer will be an underestimate.' E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'She is using the lowest values so the mean will be too small'. E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' 'It is better to use the midpoints.' | | (5) | (|
| + 30m1810 (grams)A119.(b) Valid comment e.g. 'Her answer will be an underestimate.' She is using the lowest values so the mean | | М1 | (- 24300) |
| 810 (grams) A1 19.(b) Valid comment e.g. Her answer will be an underestimate.' E1 'She is using the lowest values so the mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' 'It is better to use the midpoints.' | · · · · · · · · · · · · · · · · · · · | | (- 2+000) |
| 19.(b) Valid comment e.g. 'Her answer will be an underestimate.' 'She is using the lowest values so the mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because is is not as accurate as the midpoints.' | | m | |
| Valid comment e.g. 'Her answer will be an underestimate.' 'She is using the lowest values so the mean will be too small'. E1 Allow answers that state that the calculated mean will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because it is not as accurate as the midpoints.' 'It is better to use the midpoints.' | 810 (grams) | A1 | |
| (4) | 19.(b) Valid comment e.g. 'Her answer will be an underestimate.' 'She is using the lowest values so the mean will be too small'. | E1 | will be smaller or indicate that the lowest values do not represent the groups, e.g. 'Her method will give a smaller mean.' 'Because these values do not represent the entire range.' 'Because she ignored the distribution in each interval.' 'Because she is using the minimum masses making at an unfair estimate.' Do not allow e.g. 'She has used the smallest value in each group.' 'Because these values are the lowest bounds.' 'Because it is not as accurate as the midpoints.' |
| | | (4) | |

| 20.*(a) Valid criticism e.g. 'There are no points above the line.' 'There should be some points above and below the line.' 'It does not follow the trend of the data.' | E1 | Allow e.g. 'She has just joined the first point to the last.' 'It is not through the middle of the points.' 'It is not in between all the points.' Do not allow e.g. 'The line is in the wrong place.' 'It does not go through many points.' |
|--|-----|--|
| 20.(b) No indicated and valid comment e.g. 'Correlation does not imply causation.' or 'There could be another reason such as owning a dog for example would mean you took more exercise.' | E1 | Allow e.g. 'There is no relationship between them, it is just a coincidence.' 'Owning a pet has nothing to do with going to the doctors.' |
| | (2) | |
| 21.* 5000 × 1.02 ⁵ × 1.013 ⁴ oe, si | M3 | Method for M3 or M2 may be seen in stages M2 for use of $\times 1.02^5$ or $\times 1.013^4$ oe Note: $5000 \times 1.02^5 = 5520.40$ and $5000 \times 1.013^4 = 5265.11$ M1 for use of $\times 1.02$ or $\times 1.013$ oe Note: 5000×1.02 (= 5100) or 5000×1.013 (= 5065) |
| (£) 5813.11 or (£)5813 or (£)5813.10 | A1 | CAO A1 only from fully correct working. |
| | (4) | |

| OR $(x \in 79 + 62) \times 30 + (\pi \times 15^2) - 1$ Award M1 for one of the following: $(x < (79 + 62) \times 30 - \pi \times 15^2) (= 1408.1.)$ $(= (2115 - 225\pi) + 225\pi)$ Award M1 for one of the following: $(x < (79 + 62) \times 30 - \pi \times 15^2) (= 1408.1.)$ $(x < (79 + 62) \times 30 - \pi \times 15^2) (= 2.99)$ $(706.9 : 2115 =) 1 : 2.9(9) or 1 : 3(k =) 1.9(921) siA1(k =) 2CAOB1FT their 1.99' rounded to 1 sig fig. providing atleast M1 previously awarded, and a ratioobtained (not for rounding an area).An answer of (k =) 2 implies the previous A1 ifno incorrect working seene.g. 706.9 : 1408.1 = 1 : 2Note: unsupported answers of 1.2 \text{ or } k = 2 \text{ or are}awarded zero marks777778.7979.7070.7071.7072.*(a)5x - 2x = 6 - 4 \text{ or } 3x = 2 \text{ oe}(x =) \frac{2}{3} oe, ISW707171.7172.*(a)5x - 2x = 6 - 4 \text{ or } 3x = 2 \text{ oe}(x =) \frac{2}{3} oe, ISW71.7172.*(a)5x - 2x = 6 - 4 \text{ or } 3x = 2 \text{ oe}73.7174.75.81Allow 0.67 or 0.666 but not 0.66FT from ax = 2, a \neq 1 \text{ or } 3x = baccept \frac{2}{a} or \frac{b}{b} but if on FT either simplifies to aninteger the answer must be given as an integer.Correct answer implies first B1 unless incorrectworking seen.75.A176.Mark final answer:no marks for use of "=", unless finally replaced togive x > 5 then award M1 A1.77.78.78.A179.Mark final answer:no marks for an unsupported$ | | 1 | Г |
|--|---|-----|--|
| $\frac{1}{2} \times (79 + 62) \times 30 \text{ oe}$ B1(= 2115) $\pi(30 + 2)^2$ B1(= 706.858) $(2 \times (79 + 62) \times 30 - \pi \times 15^2) + (\pi \times 15^2)$ M2dep on at least B1 awarded; FT 'their area of trapezium' for M2 or M1 (= (2115 - 225\pi) + 225\pi)OR $? \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ M2dep on at least B1 awarded; FT 'their area of trapezium' for M2 or M1 (= (2115 - 225\pi) + 225\pi)OR $? \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ Award M1 for one of the following: • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1) • $!/_{\times} (79 + 62) \times 10^2$ (= 120.1) • $!/_{\times} (70 + 62) \times 10^2$ (= 120.1 | | D1 | |
| $\frac{1}{2} \times (79 + 62) \times 30 \text{ oe}$ $\pi(30 + 2)^2$ B1 $(= 2115)$ $(= 706.858)$ $(2 \times (79 + 62) \times 30 - \pi \times 15^2) + (\pi \times 15^2)$ M2dep on at least B1 awarded; FT "their area of circle' or their area of trapezium' for M2 or M1 $(= (2115 - 225\pi) + 225\pi)$ OR $2 \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ M2dep on at least B1 awarded; FT "their area of circle' or their area of trapezium' for M2 or M1 $(= (2115 - 225\pi) + 225\pi)$ OR $2 \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ Award M1 for one of the following: $\cdot \frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2), (= 2.99)$ $\cdot (706.9: 2115 = 1): 2.9(9) or 1: 3(k =) 1.9(921) siA1CAOB1FT their 1.99'rounded to 1 sig fig, providing atleast M1 previously awarded, and a ratioobtained (not for rounding an area).An answer of (k =) 2 mplies the previous A1 ifno incorrect working seene.g., 706.9: 1408.1 = 1: 2Note: unsupported answers of 1:2 or k = 2 or areawarded zero marks23.(h)4x > 17 + 3 oeM1x > 5A1A1Mark final answer;no marks for use of "=", unless finally replaced togive x > 5 then award M1 A1.23.(c)No marks for Ta1; no marks for an unsupportedanswer.Method to eliminate an unknown e.g. equalcoefficients and subtractionM1A1CAO; x = 2, y = -3Finds the other unknownA1CAO; x = 2, y = -3Finds the other unknownA1CAO; x = 2, y = -3Finds the other unknownA1CAO; x = 2, y = -3$ | | | |
| $x_{3}(30+2)^2$ B1 $(=706.858)$ $(x_2 \times (79+62) \times 30 - \pi \times 15^2) + (\pi \times 15^2)$ M2dep on at least B1 awarded; FT 'their area of circle' or 'their area of trapezium' for M2 or M1 $(= (2115-225\pi)+225\pi)$ OR $x_2 \times (79+62) \times 30 + (\pi \times 15^2) - 1$ M2dep on at least B1 awarded; FT 'their area of trapezium' for M2 or M1 $(= (2115-225\pi)+225\pi)$ OR $x_2 \times (79+62) \times 30 + (\pi \times 15^2) - 1$ Mard M1 for one of the following: $\cdot y_2 \times (79+62) \times 30 + (\pi \times 15^2), (= 2.99)$ $\cdot (706.9:2115=) 1: 2.9(9) or 1: 3(k=) 1.9(921) siA1CAOB1FT 'their 1.99' rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area).An answer of (k=) 2 implies the previous A1 if no incorrect working seene_3, 706.9:14081 = 1: 2Note: unsupported answers of 1:2 or k = 2 or are awarded zero marks23.*(a)5x-2x=6-4 or 3x=2 oe(x=) \frac{2}{3} oe, ISWB1Allow 0.67 or 0.666 but not 0.66FT from ax = 2, a \neq 1 or 3x = baccept \frac{2}{a} or \frac{b}{3} but if on FT either simplifies to an integer.Correct answer must be given as an integer.Correct answer implies first B1 unless incorrect working seen.23.(b)4x > 17 + 3 oeM1A1x > 5A1Mark final answer;no marks for use of "=", unless finally replaced to give x > 5 then award M1 A1.23.(c)M1A1.X = 23.(c)M1A1.A1No marks for T&1; no marks for an unsupported answer.A2.(c)M1A1.A1No marks for T&1; no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionor rearranges one equation and$ | | _ | |
| $(\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^{2}) + (\pi \times 15^{2})$ M2dep on at least B1 awarded; FT 'their area of drapezium' for M2 or M1 ($= (2115 - 225\pi) + 225\pi$)OR $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ Award M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ OR $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ Award M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) (= 2.99.)$ • $(706.9 : 2115 = 1) : 2.9(9) or 1 : 3$ Avard M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) (= 2.99.)$ • $(706.9 : 2115 = 1) : 2.9(9) or 1 : 3$ (k =) 2DB1 (k =) 2B1 (x =) 2B1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWCorrect answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) 4x > 17 + 3 oex > 5A1 23.(c)Method to eliminate an unknown e.g. equal coefficients and subtraction or or arranges one equation and substitutes into the otherMethod to eliminate an unknown e.g. equal coefficients and subtractionA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknown | 2×(79+62)×30 oe | B1 | (= 2115) |
| $(\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^{2}) + (\pi \times 15^{2})$ M2dep on at least B1 awarded; FT 'their area of drapezium' for M2 or M1 ($= (2115 - 225\pi) + 225\pi$)OR $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ Award M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ OR $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) - 1$ Award M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) (= 2.99.)$ • $(706.9 : 2115 = 1) : 2.9(9) or 1 : 3$ Avard M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^{2}) (= 2.99.)$ • $(706.9 : 2115 = 1) : 2.9(9) or 1 : 3$ (k =) 2DB1 (k =) 2B1 (x =) 2B1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWB1 (x =) $\frac{2}{3}$ oe, ISWCorrect answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) 4x > 17 + 3 oex > 5A1 23.(c)Method to eliminate an unknown e.g. equal coefficients and subtraction or or arranges one equation and substitutes into the otherMethod to eliminate an unknown e.g. equal coefficients and subtractionA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknownA1 CAO; $x = 2$, $y = -3$ Finds the other unknown | $\pi(30 \div 2)^2$ | B1 | (= 706.858) |
| OR $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ Award M1 for one of the following: $(= (2115 - 225\pi) + 225\pi)$ Award M1 for one of the following: $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ Award M1 for one of the following: $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2) . (= 2.99)$ $(k =) 1.9(921)$ siA1CAO $(k =) 2$ B1FT 'their 1.99' rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of $(k = 2)$ implies the previous A1 if no incorrect working seen $e_2, 706.9: 12408.1 = 1:2$ Note: unsupported answers of 1.2 or $k = 2$ or are awarded zero marks23.*(a) $5x - 2x = 6 - 4$ or $3x = 2$ oe $(x =) \frac{2}{3} oe, ISWB1B14x > 17 + 3 oeA1x > 5A1x > 5A1x > 5A1x > 5A23.(c)Mark final answer;no marks for use of T=", unless finally replaced togive x > 5 then award M1 A1.23.(c)Mark final answer;no marks for use of T=", unless finally replaced togive x > 5 then award M1 A1.23.(c)Mark final answer;no marks for use of T=", unless finally replaced togive x > 5 then award M1 A1.23.(c)Mark final answer;no marks for use of T=", unless finally replaced togive x > 5 then award M1 A1.23.(c)Mark final answer;no marks for use of T=", unless finally replaced togive x > 5 then award M1 A1.23.(c)Mark final answer;no marks for T&L no marks for an unsupportedanswer.Method to eliminate an unknown e.g. equalror tentranges one equation and substitutesinto the otherA1Finds ne unknown$ | | | |
| $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2) - 1$ • $\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1.) • $\frac{1}{2} \times (79 + 62) \times 30 + (\pi \times 15^2)$. (= 2.99) • (706.9 : 2115 =) 1 : 2.9() or 1 : 3 $(k =) 1.9(921)$ siA1CAO $(k =) 2$ B1FT their 1.99' rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of $(k = 2)$ amplies the previous A1 if no incorrect working seen e.g. 706.9 : 1408.1 = 1 : 2 Note: unsupported answers of 1.2 or $k = 2$ or are awarded zero marks23.*(a)(7) $5x - 2x = 6 - 4$ or $3x = 2$ oe $(x =) \frac{2}{3}$ oe, ISWB1 B1 Allow 0.67 or 0.666 but not 0.66 FT from $ax = 2$, $a \neq 1$ or $3x = b$ accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen.23.(b) $4x > 17 + 3$ oeM1 A1 $x > 5$ A1CalcMark final answer; no marks for use of "=". unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for Ta!; no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1 Allow one error in one term, not in the equated coefficients if appropriateFinds one unknownA1CAO; $x = 2$, $y = -3$ Finds one unknownA1CAO; $x = 2$, $y = -3$ Finds no unknownA1CAO; $x = 2$, $y = -3$ | $(\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2) \div (\pi \times 15^2)$ | M2 | circle' or 'their area of trapezium' for M2 or M1 |
| Key Projection y actionB1FT "their 1.99" rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of $(k =) 2$ implies the previous A1 if no incorrect working seen e.g. 706.9 : 1408.1 = 1 : 2 Note: unsupported answers of 1.2 or $k = 2$ or are awarded zero marks23.*(a) $5x-2x=6-4$ or $3x = 2$ oe $(x =) \frac{2}{3}$ oe, ISWFT B1 B1 B123.*(a) $5x-2x=6-4$ or $3x = 2$ oe $(x =) \frac{2}{3}$ oe, ISWB1 B1 B1 Allow 0.67 or 0.666 but not 0.66 FT from $ax = 2$, $a \neq 1$ or $3x = b$ accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) $4x > 17 + 3$ oeM1 A1 $x > 5$ M1 A123.(c)M1 A1Method to eliminate an unknown e.g. equal coefficients and subtraction or rearranges one equation and substitutes into the otherM1 A1Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ | OR ½ × (79 + 62) × 30 ÷ (π × 15²) – 1 | | • $\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^{2.}$ (= 1408.1) • $\frac{1}{2} \times (79 + 62) \times 30 \div (\pi \times 15^{2})$. (= 2.99) |
| IterationIter | (<i>k</i> =) 1.9(921) si | A1 | CAO |
| 23.*(a) $5x-2x=6-4 \text{ or } 3x=2 \text{ oe}$ B1 B1Allow 0.67 or 0.666 but not 0.66 FT from $ax = 2$, $a \neq 1$ or $3x = b$ accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect | (<i>k</i> =) 2 | B1 | least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of ($k = 12$ implies the previous A1 if no incorrect working seen e.g. 706.9 : 1408.1 = 1 : 2 Note: unsupported answers of 1:2 or $k = 2$ or are |
| $5x-2x=6-4$ or $3x=2$ oeB1 $(x=)$ $\frac{2}{3}$ oe, ISW $Allow 0.67$ or 0.666 but not 0.66FT from $ax = 2$, $a \neq 1$ or $3x = b$ $accept$ $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer.Correct answer implies first B1 unless incorrect working seen. $23.(b)$ $4x > 17 + 3$ oe $x > 5$ $23.(c)$ Method to eliminate an unknown e.g. equal coefficients and subtractionMethod to eliminate an unknown e.g. equal coefficients and subtractionMathematican distributionFinds one unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1< | | (7) | |
| $(x =)$ $\frac{2}{3}$ oe, ISWB1Allow 0.67 or 0.666 but not 0.66 FT from $ax = 2$, $a \neq 1$ or $3x = b$ accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) $4x > 17 + 3$ oeM1 $x > 5$ M1A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&L no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtraction or rearranges one equation and substitutes into the otherM1A1CAO; $x = 2$, $y = -3$ Finds the other unknownA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | 23.*(a) | | |
| $(x =)$ $\frac{2}{3}$ oe, ISWFT from $ax = 2$, $a \neq 1$ or $3x = b$ accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) $4x > 17 + 3$ oeM1 A1 $x > 5$ M1 A1(c)A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1 A1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1 A1Finds the other unknownA1 A1Finds the other unknownA1A1CAO; $x = 2$, $y = -3$ FT 'their x' or 'their y' used in one of their equations | | | |
| Jaccept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) $4x > 17 + 3$ oeM1 $x > 5$ M1 $accept \frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. Correct answer implies first B1 unless incorrect working seen. Maximum of 1 mark if not fully correct23.(b) $4x > 17 + 3$ oeM1 $x > 5$ A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1CAO; $x = 2, \ y = -3$ Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | $(x =) \frac{2}{2}$ oe. ISW | B1 | |
| a a </td <td>3 3 3</td> <td></td> <td>F 1 from $ax = 2$, $a \neq 1$ or $3x = b$</td> | 3 3 3 | | F 1 from $ax = 2$, $a \neq 1$ or $3x = b$ |
| Correct answer implies first B1 unless incorrect working seen. $23.(b)$ $4x > 17 + 3$ oeM1 $x > 5$ M1 $x > 5$ A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1. $23.(c)$ No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1CAO; $x = 2, y = -3$ Finds the other unknownA1Finds the other unknownA1 | | | accept $\frac{2}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an |
| working seen.23.(b) $4x > 17 + 3$ oeM1 $x > 5$ M1 $x > 5$ A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1CAO; $x = 2, y = -3$ Finds the other unknownA1Finds the other unknown <td< td=""><td></td><td></td><td>integer the answer must be given as an integer.</td></td<> | | | integer the answer must be given as an integer. |
| 23.(b) $4x > 17 + 3$ oeM1 $x > 5$ M1 $x > 5$ A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1Finds the other unknownA1 | | | |
| 4x > 17 + 3 oeM1 $x > 5$ A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1Finds the other unknownA1 | | | Maximum of 1 mark if not fully correct |
| x > 5A1Mark final answer; no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1Finds the other unknownA1A1FT 'their x ' or 'their y ' used in one of their equations | 23.(b) | | |
| no marks for use of "=", unless finally replaced to give $x > 5$ then award M1 A1.23.(c)No marks for T&I no marks for an unsupported answer.Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Finds one unknownA1Finds the other unknownA1 | 4x > 17 + 3 oe | M1 | |
| Method to eliminate an unknown e.g. equal coefficients and subtractionM1Allow one error in one term, not in the equated coefficients if appropriateor rearranges one equation and substitutes into the otherM1Allow one error in one term, not in the equated coefficients if appropriateFinds one unknownA1CAO; $x = 2, y = -3$ Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | <i>x</i> > 5 | A1 | no marks for use of "=", unless finally replaced to |
| coefficients and subtractioncoefficients if appropriateor rearranges one equation and substitutes into the othercoefficients if appropriateFinds one unknownA1CAO; $x = 2, y = -3$ Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | 23.(c) | | |
| into the otherA1CAO; $x = 2$, $y = -3$ Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | Method to eliminate an unknown e.g. equal coefficients and subtraction | M1 | |
| Finds the other unknownA1FT 'their x' or 'their y' used in one of their equations | or rearranges one equation and substitutes into the other | | |
| equations | Finds one unknown | A1 | CAO; $x = 2$, $y = -3$ |
| | Finds the other unknown | A1 | |
| | | (7) | |

| 24.* Uses <i>EC</i> = 6 oe correctly in a trigonometric statement | S1 | |
|---|-----|---|
| $(BC=) \frac{6}{\cos 35}$ or $\frac{6}{\sin (90-35)}$ | M2 | Allow equivalent complete methods for M2 or M1 |
| | | M1 for $\cos 35 = \frac{6}{BC}$ or $\sin (90 - 35) = \frac{6}{BC}$ oe |
| (<i>BC</i> =) 7.3(246) si | A1 | May be implied by a correct expression for the perimeter e.g. $\frac{24}{cos35}$ or $\frac{24}{sin55}$ oe |
| (perimeter =) 4 × 7.3(246) si | M1 | FT 'their derived <i>BC</i> ' providing S1 previously awarded and their BC > 6 |
| (perimeter =) 29.2() or 29.3 or 29 (cm) | A1 | FT |
| | (6) | |

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