



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Averages & Range · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Averages & Range

Total marks available: 98

● Averages & Range

✓5

Q1 · ● Developing · 3 marks

METHOD

Total frequency = 33

Cumulative frequencies locate the middle value(s) → median = 5

✓5

Q2 · ● Developing · 3 marks

METHOD

Total frequency = 37

Cumulative frequencies locate the middle value(s) → median = 5

✓6

Q3 · ● Developing · 3 marks

METHOD

Total frequency = 35

Cumulative frequencies locate the middle value(s) → median = 6

✓5

Q4 · ● Developing · 3 marks

METHOD

Total frequency = 28

Cumulative frequencies locate the middle value(s) → median = 5

✓2.9

Q5 · ● Developing · 3 marks

METHOD

$\Sigma(x \times f) = 137$

$\Sigma f = 47$

Mean = $137 \div 47 = 2.9$

✓5

Q6 · ● Developing · 3 marks

METHOD

Total frequency = 41

Cumulative frequencies locate the middle value(s) → median = 5

✓6

Q7 · ● Developing · 3 marks

METHOD

Total frequency = 33

Cumulative frequencies locate the middle value(s) → median = 6

✓5

Q8 · ● Developing · 3 marks

METHOD

Total frequency = 31

Cumulative frequencies locate the middle value(s) → median = 5

✓5

Q9 · ● Developing · 3 marks

METHOD

Total frequency = 38

Cumulative frequencies locate the middle value(s) → median = 5

✓5

Q10 · ● Developing · 3 marks

METHOD

Total frequency = 40

Cumulative frequencies locate the middle value(s) → median = 5

✓56

Q11 · ● Secure · 4 marks

METHOD

$$(1 \times 15) + (6 \times f) + (9 \times 1) = 5 \times (15 + f + 1)$$

$$15 + 6f + 9 = 5(16) + 5f$$

$$6f - 5f = 80 - 15 - 9$$

$$f = 56$$

✓17.8

Q12 · ● Secure · 4 marks

METHOD

Midpoints: 5, 15, 25, 35

$$\Sigma(\text{midpoint} \times f) = 5 \times 13 + 15 \times 10 + 25 \times 3 + 35 \times 10 = 640$$

$$\Sigma f = 36$$

$$\text{Estimated mean} = 640 \div 36 = 17.8$$

✓30

Q13 · ● Secure · 4 marks

METHOD

$$(1 \times 10) + (7 \times f) + (10 \times 5) = 6 \times (10 + f + 5)$$

$$10 + 7f + 50 = 6(15) + 6f$$

$$7f - 6f = 90 - 10 - 50$$

$$f = 30$$

✓28

Q14 · ● Secure · 4 marks

METHOD

$$(1 \times 11) + (6 \times f) + (9 \times 4) = 5 \times (11 + f + 4)$$

$$11 + 6f + 36 = 5(15) + 5f$$

$$6f - 5f = 75 - 11 - 36$$

$$f = 28$$

✓24

Q15 · ● Secure · 4 marks

METHOD

$$(1 \times 8) + (7 \times f) + (10 \times 4) = 6 \times (8 + f + 4)$$

$$8 + 7f + 40 = 6(12) + 6f$$

$$7f - 6f = 72 - 8 - 40$$

$$f = 24$$

✓20.5

Q16 · ● Secure · 4 marks

METHOD

Midpoints: 5, 15, 25, 35

$$\Sigma(\text{midpoint} \times f) = 5 \times 12 + 15 \times 9 + 25 \times 14 + 35 \times 12 = 965$$

$$\Sigma f = 47$$

$$\text{Estimated mean} = 965 \div 47 = 20.5$$

✓44

Q17 · ● Secure · 4 marks

METHOD

$$(1 \times 13) + (6 \times f) + (9 \times 2) = 5 \times (13 + f + 2)$$

$$13 + 6f + 18 = 5(15) + 5f$$

$$6f - 5f = 75 - 13 - 18$$

$$f = 44$$

✓16.3

Q18 · ● Secure · 4 marks

METHOD

Midpoints: 5, 15, 25, 35

$$\Sigma(\text{midpoint} \times f) = 5 \times 12 + 15 \times 12 + 25 \times 11 + 35 \times 3 = 620$$

$$\Sigma f = 38$$

$$\text{Estimated mean} = 620 \div 38 = 16.3$$

✓16.2

Q19 · ● Secure · 4 marks

METHOD

Midpoints: 5, 15, 25, 35

$$\Sigma(\text{midpoint} \times f) = 5 \times 7 + 15 \times 4 + 25 \times 3 + 35 \times 3 = 275$$

$$\Sigma f = 17$$

$$\text{Estimated mean} = 275 \div 17 = 16.2$$

✓32

Q20 · ● Secure · 4 marks

METHOD

$$(1 \times 12) + (5 \times f) + (8 \times 1) = 4 \times (12 + f + 1)$$

$$12 + 5f + 8 = 4(13) + 4f$$

$$5f - 4f = 52 - 12 - 8$$

$$f = 32$$

✓ $0 \leq t < 10$

Q21 · ● Greater Depth · 1 mark

METHOD

Highest frequency is 14, for the class $0 \leq t < 10 \rightarrow$ modal class = $0 \leq t < 10$

✓72.5

Q22 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 16 \times 80 = 1280$$

$$\text{Total score B} = 16 \times 65 = 1040$$

$$\text{Combined mean} = (1280 + 1040) \div (16 + 16) = 72.5$$

✓ $10 \leq t < 20$

Q23 · ● Greater Depth · 1 mark

METHOD

Highest frequency is 11, for the class $10 \leq t < 20 \rightarrow$ modal class = $10 \leq t < 20$

✓58.7

Q24 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 32 \times 55 = 1760$$

$$\text{Total score B} = 16 \times 66 = 1056$$

$$\text{Combined mean} = (1760 + 1056) \div (32 + 16) = 58.7$$

✓62.7

Q25 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 15 \times 72 = 1080$$

$$\text{Total score B} = 18 \times 55 = 990$$

$$\text{Combined mean} = (1080 + 990) \div (15 + 18) = 62.7$$

✓68.9

Q26 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 30 \times 58 = 1740$$

$$\text{Total score B} = 27 \times 81 = 2187$$

$$\text{Combined mean} = (1740 + 2187) \div (30 + 27) = 68.9$$

✓66.0

Q27 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 20 \times 54 = 1080$$

$$\text{Total score B} = 15 \times 82 = 1230$$

$$\text{Combined mean} = (1080 + 1230) \div (20 + 15) = 66.0$$

✓79.1

Q28 · ● Greater Depth · 4 marks

METHOD

$$\text{Total score A} = 31 \times 75 = 2325$$

$$\text{Total score B} = 32 \times 83 = 2656$$

$$\text{Combined mean} = (2325 + 2656) \div (31 + 32) = 79.1$$

✓ $20 \leq t < 30$

Q29 · ● Greater Depth · 1 mark

METHOD

Highest frequency is 10, for the class $20 \leq t < 30 \rightarrow$ modal class = $20 \leq t < 30$

✓ $30 \leq t < 40$

Q30 · ● Greater Depth · 1 mark

METHOD

Highest frequency is 14, for the class $30 \leq t < 40 \rightarrow$ modal class = $30 \leq t < 40$