
GCSE Mathematics

Averages from Grouped Data

Mark Scheme - Grades 5-6

M = method mark, A = accuracy mark (dependent on the preceding M mark), B = independent mark.

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Edexcel-style questions

Q1 Grade 5 Edexcel style

Total: 1

Part	Mark scheme	Marks
(a)	modal class = $25 \leq h < 30$	B1

Q2 Grade 5 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	total frequency = $3 + 7 + 11 + 12 + 7 = 40$	M1
(a)	the 20th value lies in the ' $20 \leq h < 25$ ' class (cumulative frequency 21)	M1
(a)	median class = $20 \leq h < 25$	A1

Q3 Grade 5 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 12.5, 17.5, 22.5, 27.5, 32.5	M1
(a)	$\Sigma fx = 3(12.5) + 7(17.5) + 11(22.5) + 12(27.5) + 7(32.5) = 965$	M1
(a)	mean = $965 \div 40 = 24.1$ cm (1 d.p.)	A1

Q4 Grade 6 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 7.5, 22.5, 37.5, 52.5, 67.5	M1
(a)	$\Sigma fx = 4(7.5) + 9(22.5) + 16(37.5) + 14(52.5) + 7(67.5) = 2040$	M1
(a)	mean = $2040 \div 50 = 40.8$ cm	A1

Q5 Grade 6 Edexcel style

Total: 4

Part	Mark scheme	Marks
(a)	$\Sigma fx = 6(5) + 10(15) + x(25) + 9(35) + 3(45) = 630 + 25x$	M1
(a)	total frequency = $6 + 10 + x + 9 + 3 = 28 + x$	M1
(a)	$(630 + 25x) \div (28 + x) = 23$, so $630 + 25x = 23(28 + x)$	M1
(a)	$x = 7$	A1

AQA-style questions

Q6 Grade 5 AQA style

Total: 1

Part	Mark scheme	Marks
(a)	modal class = $40 \leq t < 50$	B1

Q7 Grade 5 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	total frequency = $4 + 8 + 13 + 10 + 5 = 40$	M1
(a)	the 20th value lies in the ' $40 \leq t < 50$ ' class (cumulative frequency 25)	M1
(a)	median class = $40 \leq t < 50$	A1

Q8 Grade 5 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 25, 35, 45, 55, 65	M1
(a)	$\Sigma fx = 4(25) + 8(35) + 13(45) + 10(55) + 5(65) = 1840$	M1
(a)	mean = $1840 \div 40 = 46$ seconds	A1

Q9 Grade 6 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 17.5, 32.5, 47.5, 62.5, 77.5	M1
(a)	$\Sigma fx = 5(17.5) + 11(32.5) + 17(47.5) + 10(62.5) + 7(77.5) = 2420$	M1
(a)	mean = $2420 \div 50 = 48.4$ seconds	A1

Q10 Grade 6 AQA style

Total: 4

Part	Mark scheme	Marks
(a)	$\Sigma fx = 8(25) + x(35) + 12(45) + 7(55) + 4(65) = 1385 + 35x$	M1
(a)	total frequency = $8 + x + 12 + 7 + 4 = 31 + x$	M1
(a)	$(1385 + 35x) \div (31 + x) = 41$, so $1385 + 35x = 41(31 + x)$	M1
(a)	$x = 19$	A1

OCR-style questions

Q11 Grade 5 OCR style**Total: 1**

Part	Mark scheme	Marks
(a)	modal class = $140 \leq w < 160$	B1

Q12 Grade 5 OCR style**Total: 3**

Part	Mark scheme	Marks
(a)	total frequency = $6 + 9 + 14 + 7 + 4 = 40$	M1
(a)	the 20th value lies in the ' $140 \leq w < 160$ ' class (cumulative frequency 29)	M1
(a)	median class = $140 \leq w < 160$	A1

Q13 Grade 5 OCR style**Total: 3**

Part	Mark scheme	Marks
(a)	midpoints: 110, 130, 150, 170, 190	M1
(a)	$\Sigma fx = 6(110) + 9(130) + 14(150) + 7(170) + 4(190) = 5880$	M1
(a)	mean = $5880 \div 40 = 147$ g	A1

Q14 Grade 6 OCR style**Total: 3**

Part	Mark scheme	Marks
(a)	midpoints: 87.5, 102.5, 117.5, 132.5, 147.5	M1
(a)	$\Sigma fx = 6(87.5) + 10(102.5) + 15(117.5) + 12(132.5) + 7(147.5) = 5935$	M1
(a)	mean = $5935 \div 50 = 118.7$ g	A1

Q15 Grade 6 OCR style**Total: 4**

Part	Mark scheme	Marks
(a)	$\Sigma fx = 5(90) + 9(110) + 11(130) + x(150) + 4(170) = 3550 + 150x$	M1
(a)	total frequency = $5 + 9 + 11 + x + 4 = 29 + x$	M1
(a)	$(3550 + 150x) \div (29 + x) = 125$, so $3550 + 150x = 125(29 + x)$	M1
(a)	$x = 3$	A1

Teachably-style questions

Q16 Grade 5 Teachably style

Total: 1

Part	Mark scheme	Marks
(a)	modal class = $30 \leq d < 40$	B1

Q17 Grade 5 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	total frequency = $5 + 7 + 9 + 13 + 6 = 40$	M1
(a)	the 20th value lies in the ' $20 \leq d < 30$ ' class (cumulative frequency 21)	M1
(a)	median class = $20 \leq d < 30$	A1

Q18 Grade 5 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 5, 15, 25, 35, 45	M1
(a)	$\Sigma fx = 5(5) + 7(15) + 9(25) + 13(35) + 6(45) = 1080$	M1
(a)	mean = $1080 \div 40 = 27$ km	A1

Q19 Grade 6 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	midpoints: 12.5, 27.5, 42.5, 57.5, 72.5	M1
(a)	$\Sigma fx = 7(12.5) + 12(27.5) + 14(42.5) + 10(57.5) + 7(72.5) = 2095$	M1
(a)	mean = $2095 \div 50 = 41.9$ km	A1

Q20 Grade 6 Teachably style

Total: 4

Part	Mark scheme	Marks
(a)	$\Sigma fx = 6(5) + 11(15) + 14(25) + 9(35) + x(45) = 860 + 45x$	M1
(a)	total frequency = $6 + 11 + 14 + 9 + x = 40 + x$	M1
(a)	$(860 + 45x) \div (40 + x) = 25$, so $860 + 45x = 25(40 + x)$	M1
(a)	$x = 7$	A1

END OF PAPER

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