
GCSE Mathematics

Vectors

Mark Scheme - GCSE Maths Practice

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

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Edexcel-style questions

Q1 Grade 7 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	5 across, 3 up	M1
(a)	$AB = (5, 3)$	A1

Q2 Grade 7 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$\sqrt{6^2 + 8^2}$	M1
(a)	$ a = \sqrt{100} = 10$	A1

Q3 Grade 8 Edexcel style

Total: 1

Part	Mark scheme	Marks
(a)	$AB = OB - OA = b - a$	A1

Q4 Grade 8 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$OP = OA + AP = a + \frac{2}{3}(b - a)$	M1
(a)	$OP = \frac{1}{3}a + \frac{2}{3}b$	A1

Q5 Grade 9 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$OM = \frac{1}{2}(a + b)$, so $OG = \frac{2}{3} \times OM$	B1
(a)	since OG is a scalar multiple of OM, O, G and M are collinear, with $OG : GM = 2 : 1$	A1

AQA-style questions

Q6 Grade 7 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	$(3 + (-1), -2 + 4)$	M1
(a)	$a + b = (2, 2)$	A1

Q7 Grade 7 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	$(-5)^2 + 12^2 = 169$	M1
(a)	$ a = \sqrt{169} = 13$	A1

Q8 Grade 8 AQA style

Total: 1

Part	Mark scheme	Marks
(a)	$OB = OA + AB = a + b$	A1

Q9 Grade 9 AQA style

Total: 1

Part	Mark scheme	Marks
(a)	$BC = OC - OB = 1.5a - b$	A1

Q10 Grade 9 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$OR = \frac{1}{2}(p + q)$, so $OS = 2 \times OR = p + q$	M1
(a)	$QS = OS - OQ = (p + q) - q = p$	M1
(a)	$QS = p = OP$, so OP is parallel and equal to QS : $OPSQ$ is a parallelogram	A1

OCR-style questions

Q11 Grade 7 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	$(-3 \times 4, -3 \times 1)$	M1
(a)	$-3a = (-12, -3)$	A1

Q12 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$k^2 + 4^2 = 5^2$	M1
(a)	$k^2 = 25 - 16 = 9$	M1
(a)	$k = 3$	A1

Q13 Grade 8 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	$OM = OA + AM = a + \frac{1}{2}(b - a)$	M1
(a)	$OM = \frac{1}{2}a + \frac{1}{2}b = \frac{1}{2}(a + b)$	A1

Q14 Grade 9 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	$OP = \frac{3}{4}a, OQ = \frac{3}{4}b$	M1
(a)	$PQ = OQ - OP = \frac{3}{4}b - \frac{3}{4}a = \frac{3}{4}(b - a)$	A1

Q15 Grade 9 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$OC = \frac{3}{5}a, OD = \frac{3}{5}b$	M1
(a)	$CD = OD - OC = \frac{3}{5}b - \frac{3}{5}a = \frac{3}{5}(b - a); AB = OB - OA = b - a$	M1
(a)	$CD = \frac{3}{5} \times AB$, so CD is parallel to AB, with $CD : AB = 3 : 5$	A1

Teachably-style questions

Q16 Grade 7 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	$(2 \times 2 - (-3), 2 \times 5 - 1)$	M1
(a)	$2a - b = (7, 9)$	A1

Q17 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$a + b = (4, -4)$	M1
(a)	$ a + b = \sqrt{4^2 + (-4)^2} = \sqrt{32}$	M1
(a)	$ a + b = 4\sqrt{2}$	A1

Q18 Grade 8 Teachably style

Total: 1

Part	Mark scheme	Marks
(a)	$CA = OA - OC = a - b$	A1

Q19 Grade 8 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	$MN = ON - OM = \frac{1}{2}b - \frac{1}{2}a = \frac{1}{2}(b - a)$	M1
(a)	$MN = \frac{1}{2}(b - a)$; since $AB = b - a$, MN is parallel to AB and half its length	A1

Q20 Grade 9 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$AB = (5 - 2)i + (-1 - 3)j = 3i - 4j$	M1
(a)	$ AB = \sqrt{3^2 + (-4)^2} = \sqrt{25}$	M1
(a)	$ AB = 5$	A1

END OF PAPER

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