
GCSE Mathematics

Functions

Mark Scheme - Higher | Grades 6-9

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

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Edexcel-style questions

Q1 Grade 6 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	$f(5) = 3(5) - 2$	M1
(a)	$f(5) = 13$	A1

Q2 Grade 7 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$5x - 3 = 17$	M1
(a)	$5x = 20$	M1
(a)	$x = 4$	A1

Q3 Grade 7 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$g(2) = 2 - 3 = -1$	M1
(a)	$f(-1) = 2(-1) + 1$	M1
(a)	$fg(2) = -1$	A1

Q4 Grade 8 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$y = 4x - 3$	M1
(a)	$x = \frac{y+3}{4}$	M1
(a)	$f^{-1}(x) = (x + 3) \div 4$	A1

Q5 Grade 9 Edexcel style

Total: 4

Part	Mark scheme	Marks
(a)	$2a + b = 7$	M1
(a)	$5a + b = 19$	M1
(a)	$3a = 12 \Rightarrow a = 4$	M1
(a)	$b = -1$	A1

AQA-style questions

Q6 Grade 6 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	$f(-2) = 4(-2) + 1$	M1
(a)	$f(-2) = -7$	A1

Q7 Grade 7 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$2x + 7 = -1$	M1
(a)	$2x = -8$	M1
(a)	$x = -4$	A1

Q8 Grade 7 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$f(1) = 1 + 4 = 5$	M1
(a)	$g(5) = 3(5)$	M1
(a)	$gf(1) = 15$	A1

Q9 Grade 8 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$y = 2x + 7$	M1
(a)	$x = \frac{y-7}{2}$	M1
(a)	$f^{-1}(x) = (x - 7) \div 2$	A1

Q10 Grade 9 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	let $u = x + 3 \Rightarrow x = u - 3$	M1
(a)	$f(u) = 2(u - 3) + 5$	M1
(a)	$f(x) = 2x - 1$	A1

OCR-style questions

Q11 Grade 6 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	$f(4) = (4)^2 - 3$	M1
(a)	$f(4) = 13$	A1

Q12 Grade 7 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$\frac{x+3}{2} = 5$	M1
(a)	$x + 3 = 10$	M1
(a)	$x = 7$	A1

Q13 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$fg(x) = f(x + 2) = (x + 2)^2$	M1
(a)	$(x + 2)^2 = x^2 + 4x + 4$	M1
(a)	$fg(x) = x^2 + 4x + 4$	A1

Q14 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$y = \frac{x-5}{3}$	M1
(a)	$x = 3y + 5$	M1
(a)	$f^{-1}(x) = 3x + 5$	A1

Q15 Grade 9 OCR style

Total: 4

Part	Mark scheme	Marks
(a)	$ff(x) = 3(3x - 4) - 4$	M1
(a)	$ff(x) = 9x - 16$	M1
(a)	$9x - 16 = 11 \Rightarrow 9x = 27$	M1
(a)	$x = 3$	A1

Teachably-style questions

Q16 Grade 6 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	$f(-3) = 2(-3)^2 + 1$	M1
(a)	$f(-3) = 19$	A1

Q17 Grade 7 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$x^2 - 5 = 4 \Rightarrow x^2 = 9$	M1
(a)	$x = 3$	A1
(a)	$x = -3$	A1

Q18 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$gf(x) = g(2x - 1) = (2x - 1)^2$	M1
(a)	$(2x - 1)^2 = 4x^2 - 4x + 1$	M1
(a)	$gf(x) = 4x^2 - 4x + 1$	A1

Q19 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$y = 5 - 2x$	M1
(a)	$x = \frac{5 - y}{2}$	M1
(a)	$f^{-1}(x) = (5 - x) \div 2$	A1

Q20 Grade 9 Teachably style

Total: 4

Part	Mark scheme	Marks
(a)	$fg(x) = x^2 + 3$	M1
(a)	$gf(x) = (x + 3)^2 = x^2 + 6x + 9$	M1
(a)	$x^2 + 3 = x^2 + 6x + 9 \Rightarrow 6x = -6$	M1
(a)	$x = -1$	A1

END OF PAPER

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