

Edexcel

GCSE

Mathematics

SET B

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Answers

Key to abbreviations used within the answers

M method mark (e.g. M1 means 1 mark for method)

A accuracy mark (e.g. A1 means 1 mark for accuracy)

B independent marks that do not require method to be shown (e.g. B2 means 2 independent marks)

dep dependent on previous mark

ft follow through

oe or equivalent

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Paper 1

Question	Answer	Mark	Comments
1	$x + 3$	B1	
2	2 and -3	B1	
3	$6^2 + 4^2$	M1	
	$6^2 + 4^2 = 52$, $\sqrt{52}$ cm	A1	
4	$6x - 12 + 8 = x$	M1	
	$5x = 4$	M1dep	
	$x = 0.8$ oe	A1	
5	Area of any face, i.e. 20×5 or 100 etc.	M1	
	$2 \times 100 + 2 \times 50 + 2 \times 200$	M1dep	
	700	A1	
6	$4x + 4 - 6x + 8$	M1	M1 for 3 terms correct
	$4x + 4 - 6x + 8$	A1	A1 for 4 terms correct
	$-2x + 12$	A1ft	ft on M1, e.g. $4x + 1 - 6x - 8 = -2x - 7$ is M1, A0, A1ft
7	$2x + 100 = 180$	M1	
	$360 \div 40$	M1dep	
	9	A1	
8 (a)	230 000	B1	
(b)	5×10^{-4}	B1	
(c)	1.6×10^8	B2	B1 for 16×10^7
9 (a)	-1.5 and 3	B2	B1 each answer
(b)	$(0.75, -6.1)$	B1	
10	$x + 2 = 2x - 1$	M1	
	$x = 3$	A1	
	$3 + 2$ or $2 \times 3 - 1$	M1dep	
	5	A1	
	25	A1	

Question	Answer	Mark	Comments
11	$x^2 + 2x + 1$ or $x^2 - 2x - 3$	M1	
	$x^3 - 3x^2 + 2x^2 - 6x + x - 3$	M1dep	
	$x^3 - x^2 - 5x - 3$	A1	
12	$\pi \times (r)^2 \times 6r$	M1	oe
	their $6\pi r^3 = 48\pi$	M1dep	
	2	A1	
13	$x \leq 6$	B1	
	$x + y \geq 7$	B1	
	$y \leq x + 1$	B1	
14	$27 + 9\sqrt{2} - 3\sqrt{8} - \sqrt{16}$	M1	oe
	$27 + 9\sqrt{2} - 6\sqrt{2} - 4$	A1	
	$23 + 3\sqrt{2}$	A1	
15	Vertical scale marked to at least 3.5 Bar between 5–10 to a height of 3 Bar between 10–20 to a height of 3.5 Bar between 20–35 to a height of 2 Bar between 35–45 to a height of 1.5 Bar between 45–50 to a height of 1	B3	B2 Scale marked and any two bars B1 Scale marked and any 1 bar
16 (a) (b) (c)	56°	B1	
	60°	B1	
	ACB stated or shown as 32	B1	
	CAB stated or shown as 90 (may be implied by working)	B1	
	58°	B1	
17	16	B2	B1 for $(\sqrt[3]{64})^2$ oe B1 for $\sqrt[3]{64} = 4$
18 (a) (b) (c)	24	B1	
	31 and 17 seen	M1	
	14	A1	
	Valid box plot with Median marked (ft their median) IQR marked (ft their IQR) Minimum value as 5 and maximum as 50	B2	B1 any 2 components

Question	Answer	Mark	Comments
19 (a)	$\mathbf{a} + \frac{3}{2}\mathbf{b}$	B1	
(b)	$\overline{BC} = \overline{BA} + \overline{AO} +$ $\overline{OC} = -\mathbf{a} + \frac{1}{2}\mathbf{b}$ or $-\frac{3}{2}\mathbf{b} - \mathbf{a} + \overline{OC}$ $= -\mathbf{a} + \frac{1}{2}\mathbf{b}$	M1	
	$2\mathbf{b}$	A1	
20	$x = 0.733333\dots$ and $10x = 7.33333$	M1	
	$9x = 6.6$ or $\frac{66}{90}$	A1	
	$3\frac{11}{15}$	A1	
21	$\frac{x^2}{2} = 9$	M1	
	$x = 3\sqrt{2}$	A1	
	Hypotenuse = 6	A1	
	$6 + 2 \times 3\sqrt{2}$	M1	
	$6 + 6\sqrt{2}$	A1	
22	Tree diagram with at least 3 correct probabilities marked or $P(R \text{ and } B) + P(B \text{ and } R)$	M1	
	All correct probabilities identified as $\frac{7}{10}$, $\frac{3}{10}$, $\frac{6}{9}$ oe, $\frac{3}{9}$ oe, $\frac{7}{9}$ and $\frac{2}{9}$ or one of $\frac{7}{10} \times \frac{3}{9}$ or $\frac{3}{10} \times \frac{7}{9}$	A1	
	$\frac{7}{10} \times \frac{3}{9} + \frac{3}{10} \times \frac{7}{9}$	M1dep	
	$\frac{42}{90}$ or $\frac{7}{15}$	A1	

Question	Answer	Mark	Comments
23	$(2x + 3)(2x - 5)$ $(2x - 3)(x + 4)$ $2(x + 4)$ $(2x - 3)(2x + 3)$	B3	B2 three factorisations B1 two factorisations
	$\frac{2x-5}{2}$	B1	
24	Gradient $AB = -\frac{1}{2}$	M1	
	Gradient perpendicular = 2	A1	
	Midpoint $AB = (5, 9)$	B1	
	$9 = 2 \times 5 + c$	M1	
	$y = 2x - 1$	A1	

Paper 2

Question	Answer	Mark	Comments
1	(7, 6)	B2	B1 either coordinate
2 (a)	alternate	B1	
(b)	$a + b = 180$	B1	
3	Correct translation i.e. $(1, 1) \rightarrow (-2, -3)$ etc.	B2	B1 for correct translation of one vector component
4	$6^2 + 11^2$	M1	
	$\sqrt{157}$	M1dep	
	12.5...	A1	
5	$5 \times 145 + 9 \times 155 + 12 \times 165 + 8 \times 175 + 6 \times 185$ or 6610	M1	
	$6610 \div 40$	M1dep	
	165.25	A1	
6 (a)	Any product including a prime that makes 28	M1	
	$2 \times 2 \times 7$ or $2^2 \times 7$	A1	
(b)	$2 \times 2 \times 5 \times 7$	M1	
	140	A1	

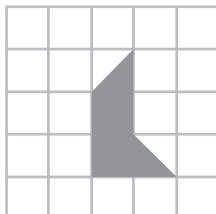
Question	Answer	Mark	Comments
7	$4(x + 4) = 26$	M1	
	$4x = 10$	M1dep	
	2.5	A1	
8	0.85	B1	
	$238 \div 0.85$	M1	
	280	A1	
9	$36 \div 3$ or 12	M1	
	2×12 or 5×12	M1dep	
	24 and 60	A1	
10	$\sqrt{\frac{402}{\pi}}$ or 11.3...	M1	
	$11.3 \times \pi + 2 \times 11.3$	M1dep	
	[58, 58.2]	A1	
11	Arc from A cutting given line	M1	
	Arc centred on intersection and crossing original arc plus line drawn and angle 60° drawn	A1	
	60° angle bisected	A1	Angle must be between [26, 32]
12 (a) (b)	$4x^2 - 8x + 3x - 6$	M1	
	$20x^2 - 25x - 30$	A1	
	$2(x + a)(x + b)$	M1	$ab = \pm 3$
	$2(x + 1)(x + 3)$	A1	oe e.g. $(2x + 2)(x + 3)$
13	Triangle between (3, 9), (4, 9) and (4, 7)	B3	B2 two vertices correct B1 rays marked through (5, 8)
14	30×1.6 or 48	M1	
	$(\text{their } 48 - 40) \div 40$ ($\times 100$)	M1dep	
	20	A1	

Question	Answer	Mark	Comments
15 (a) (b)	$(x + 3)^2$	M1	
	$(x + 3)^2 - 9$	M1dep	
	$(x + 3)^2 - 18$	A1	
	$x + 3 = \sqrt{18}$	M1	
	$x = -3 \pm \sqrt{18}$	A1	
16	$2(4x - 1) - 3(x + 1)$	M1	
	$5x - 5 =$	A1	
	$(4x - 1)(x + 1)$ or $4x^2 + 4x - x - 1$	M1	
	$4x^2 - 2x + 4$	A1	
17 (a) (b)	$y = kx^2$ and $20 = k \times 2^2$	M1	
	$k = 5$	A1	
	500	A1	
	$5 = 5 \times x^2$	M1	
	± 1	A1	Condone omission of \pm
18	$x(x - 6) + 2x + x - 4 + x + 30 = 146$	M1	
	$x^2 - 2x - 120 = 0$	A1	
	$(x - 12)(x + 10) = 0$	A1	
	$x = 12$	A1	
	$\frac{8}{146}$ or $\frac{4}{73}$	A1	
19 (a) (b)	$\cos x = \frac{10^2 + 7^2 - 13^2}{2 \times 10 \times 7}$	M1	
	$-\frac{1}{7}$	A1	
	98.2	A1	
	$\frac{1}{2} \times 7 \times 10 \times \sin$ (their 98.2)	M1	
	34.6...	A1	

Question	Answer	Mark	Comments
20	$\frac{6(3 + \sqrt{3})}{(3 - \sqrt{3})(3 + \sqrt{3})}$	M1	
	$\frac{18 + 6\sqrt{3}}{9 - 3}$	A1	
	$\frac{6(3 + \sqrt{3})}{6}$	A1	
21	11.5 or 12.5 or 8.25 or 8.35	M1	
	11.5 and 12.5 and 8.25 and 8.35	M1dep	
	$8.25 \div 12.5$ or $8.35 \div 11.5$	M1	
	Upper 46.6	A1	
	Lower 41.3	A1	
22 (a)	Tangent drawn at 3	M1	
	y-step and x-step measured	M1dep	
	[0.7, 1.1]	A1ft	ft their tangent
	Attempt to calculate area under curve	M1	
	[75, 85]	A1ft	ft their area
	Their area $\div 10$	M1dep	
	[7.5, 8.5]	A1	

Paper 3

Question	Answer	Mark	Comments
1	729	B1	
2	125	B1	
3 (a)	x^9	B1	
(b)	x^{10}	B1	
4	$\begin{pmatrix} 10 \\ 4 \end{pmatrix}$	B2	B1 for each component
5	-2, -1, 0, 1, 2, 3	B2	B1 for -3, -2, -1, 0, 1, 2, 3 B1 for -2, -1, 0, 1, 2, 3, 4

Question	Answer	Mark	Comments
6	$1^2 + 2^2$	M1	
	$\frac{\sqrt{3}}{2}$	A1	
7		B2	B1 for any enlargement that reduces the size of the shape and keeps the side in relative ratio. B1 for any 3 sides correct.
8	$1.5 \div 2$	M1	
	0.75	A1	
9 (a)	$\frac{4}{10}$ marked on red and $\frac{6}{10}$ marked on blue	B1	
	$\frac{4}{10} \times \frac{4}{10}$ or $\frac{6}{10} \times \frac{6}{10}$	M1	
	$\frac{4}{10} \times \frac{4}{10} + \frac{6}{10} \times \frac{6}{10}$	M1dep	
	0.52	A1	oe
10	$3x + 2y = 2$ and $3x + 12y = 27$ or $6x + 4y = 4$ and $x + 4y = 9$	M1	
	$x = -1$	A1	
	$y = 2.5$	A1	
11 (a)	$(x + 5)(x - 5)$	B1	
	$x^2 + 4x + 4$ or $x^2 + 2x + 1$	M1	$(x + 2 + x + 1)$ $(x + 2 - (x + 1))$
	$x^2 + 4x + 4 - (x^2 + 2x + 1)$	M1 dep	$(2x + 3)(1)$
	Shows subtraction of terms clearly	A1	

Question	Answer	Mark	Comments
12 (a)	$12 \times \sin 32 = 6.359\dots$	B1	
(b)	$\pi \times 6.36 \times 12$	M1	
	[236.6, 240]	A1	
13	0.92	B1	
	0.92^n for $n > 3$	M1	
	9 years	A1	Accept just over 8 or between 8 and 9
14	A C B	B2	B1 for 1 correct
15	$4x^4y^6$	B2	B1 for 2 parts correct
16 (a)	B and D	B1	
(b)	A and D	B1	
17 (a)	30 and 38	B2	B1 each
(b)	Works out second difference as 2	M1	
	Subtracts n^2 from series, i.e. 5, 6, 7, 8, 9 ...	M1dep	
	Identifies $n + 4$ as linear sequence	A1	
	$n^2 + n + 4$	A1	
18	Shows reflected triangle B at (7, 2), (7, 4) and (9, 4)	M1	
	Shows reflected triangle C at (1, 4), (3, 4) and (3, 2)	M1dep	
	Rotation, 180° , about (5, 6)	A2	A1 for 2 parts. Accept reflection in line $y + x = 11$ oe
19	$\frac{x}{\sin 78} = \frac{11}{\sin 65}$	M1	
	$x = \frac{11 \times \sin 78}{\sin 65}$	M1dep	
	[11.87, 11.9]	A1	
20	$14 \div 8$ or 1.75	M1	
	$540 \times (\text{their } 1.75)^3$	M1dep	
	2890	A1	

Question	Answer	Mark	Comments
21	$AC = \sqrt{8^2 + 6^2}$ or 10	M1	
	$CX = 5$	A1	
	$VX = \sqrt{12^2 - 5^2}$ or $\sqrt{119}$ or 10.9...	M1dep	
	Angle $VCX = \sin^{-1}(10.9 \div 12)$	M1dep	Can use cos or tan
	[65, 65.4]	A1	
22 (a)	$b = \sqrt[3]{2a - 3}$	B1	
(b)	-1	B1	
(c)	-1.89	B2	B1 for any further iterations or 1.89...
23 (a)	$x^2 + y^2 = 16$	B1	
(b)	Angle = $\tan^{-1}(2)$ or 63.43...	M1	
	(their $63.43 \div 360$) $\times 2 \times \pi \times$ their radius	M1dep	
	[4.36, 4.43]	A1	
24	$\frac{4}{9}x$	M1	
	$\frac{4}{9}x + 7$	M1dep	
	$\frac{4}{9}x + 7 = \frac{x+7}{2}$	M1dep	
	$\frac{1}{18}x = \frac{7}{2}$	M1dep	
	63	A1	T&I B1 for correct answer
25 (a)	$\frac{x+1}{3}$	B2	B1 for numerator of $3(x+1)$ B1 for $\frac{x-1}{3}$
(b)	$3(x^2 + 2) - 1$	M1	
	$3x^2 + 5$	A1	
26	$x^2 + (x + 3)^2$	M1	
	$x^2 + x^2 + 6x + 9 = x + 12$	A1	
	$2x^2 + 5x - 3 = 0$	M1	
	$(2x - 1)(x + 3)$	A1	
	$\left(\frac{1}{2}, 3\frac{1}{2}\right)$ and $(-3, 0)$	A1	

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