

GCSE MATHEMATICS
COMPONENT 1 - FOUNDATION TIER
AUTUMN 2018 MARK SCHEME

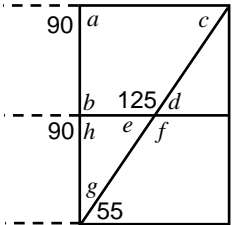
GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
1.(a)(i) 51	B1	
(a)(ii) 705[.00]	B1	
(a)(iii) 7	B1	
(a)(iv) $\frac{150}{10} \times 4$ or equivalent full method 60	M1 A1	Any partitioning method must be complete and correct; e.g. 'their 10% of 150' $\times 4$ or 'their 50% of 150' – 'their 10% of 150';
(b) $5 - 3 \neq 8$	B1	CAO
	(6)	
2.(a) Point marked at $(-4, 3)$	B1	
(b) $(-4, 3)$	B1	FT their plotted point
(c) 32 cm	B2	B1 for either
	(4)	
3. $4c + 15$	B2	B1 for a correct unsimplified expression e.g. $c + c + c + c + 15$ If no marks award SC1 for an answer of $3c + 15$
	(2)	
4.(a) Correct reflection	B1	Allow freehand; mark intent
(b) Parallelogram drawn	B1	Allow freehand; mark intent
	(2)	

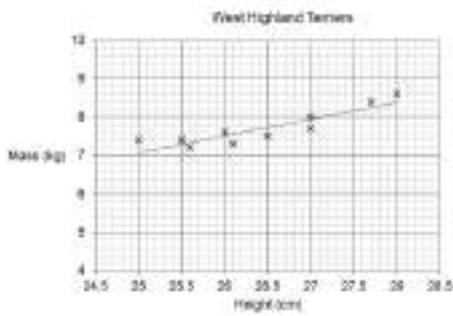
5.(a)(i) 32	B1	Allow –32
(a)(ii) –40	B1	
(b)(i) –3 and 4	B2	In either order B1 for two numbers with opposite signs whose product is –12 or whose sum is 1
(b)(ii) Correct solution e.g. 5 and –2 and –3 or 6 and –5 and –1	B2	In any order B1 for three numbers with two negative whose product is 30 or whose sum is 0 or for –5 and 2 and 3 or –6 and 5 and 1, three numbers whose product is –30 and whose sum is 0.
	(6)	
6.(a) 4×4500 or equivalent 18 000	M1 A1	Or $\frac{4500}{15} \times 60$ If no marks then allow SC1 for a correctly evaluated $\frac{\text{distance}}{\text{time}}$ calculation e.g. $\frac{4500}{15} = 300$ (metres per min)
(b) 18	B1	FT 'their 18 000'
	(3)	
7.(a) 112	B2	B1 for evidence of 2 correct costs from 40, 24, 18, 30 or for $11 \times 10 + 10 \div 2$ or equivalent
(b) $16 \times 5 + 12.50$ or equivalent (£)92.50	M1 A1	If no marks, SC1 for an answer of 204.50 (including the 112)
(c) $\frac{6}{600} [\times 100]$ oe 1	M1 A1	Or 1% is $600 \div 100$; may be in steps
(d)(i) 12 : 1 or equivalent	B1	e.g. 60 : 5
(d)(ii) $(60 \div 12) \times 3$ or equivalent 15	M1 A1	May be seen in stages
	(9)	

8.(a)	6	B1	
(b)	Yes with valid explanation e.g. 'because $52\text{cm} \times 2 = 104\text{ cm}$ ' or 'the diameter will be $104\text{ cm} = 1.04\text{ m}$ ' or 'the diameter is more than 100.'	B1	
(c)(i)	Use of 12 or 10 bags Suitable calculation e.g. $(\pounds)7[.00] \times 12$ or $(\pounds)7.2[0] \times 12$ or $(\pounds)7[.00] \times 10$ or $(\pounds)7.2[0] \times 10$ or $(\pounds)7.19 \times 10$ Correct evaluation e.g. $(\pounds)84[.00]$ or $(\pounds)86.4[0]$ or $(\pounds)70[.00]$ or $(\pounds)72[.00]$ or $(\pounds)71.9[0]$	M1 M1 A1	or equivalent; allow $(\pounds)7.5[0] \times 12$ or $(\pounds)7.5[0] \times 10$ or a less accurate rounding e.g. $(\pounds)10 \times 12$ or $(\pounds)10 \times 10$ Method must be shown; allow $(\pounds)90[.00]$ or $(\pounds)75.00$ If first M0, allow M1 for $(\pounds)7[.00] \times 18$ or $(\pounds)7[.00] \times 20$ or $(\pounds)7.2[0] \times 18$ or $(\pounds)7.2[0] \times 20$ or $(\pounds)7.19 \times 20$ or $(\pounds)7.5[0] \times 18$ or $(\pounds)7.5[0] \times 20$ or equivalent or for a less accurate rounding e.g. 10×20 and A1 for correct evaluation e.g. $(\pounds)126[.00]$ or $(\pounds)140[.00]$ or $(\pounds)129.6[0]$ or $(\pounds)144[.00]$ or $(\pounds)143.80$ or $(\pounds)135[.00]$ or $(\pounds)150[.00]$ If M1 M0, allow SC1 for $[12 \times 7.19 =] \pounds 86.28$ rounded to $\pounds 86[.00]$ or $\pounds 90[.00]$
(c)(ii)	Appropriate answer e.g. 'Under-estimate as I rounded down.'	E1	Dependent on their calculation for (c)(i); cannot be awarded if (c)(i) is not attempted. NB compare with $\pounds 86.28$
		(6)	
9. (a)	$30 \times 50\text{p}$ or $30 \times 8.5 - 30 \times 8$ $(\pounds)15(.00)$ or equivalent	M1 A1	or equivalent Allow 1500p if final answer in working space or if \pounds on answer line is deleted.
(b)	$(30 + 2 \times 5) \times 6(.00)$ $(\pounds)240(.00)$	M1 A1	or equivalent If no marks award SC1 for $[5.55 \times 40 =] (\pounds) 222$
(c)	$160 \div (30 + 2 \times 5)$ $(\pounds)4$ (per hour) or equivalent 2016 Under 18	M1 A1 B1	seen or implied Implies M1 A1 provided not from wrong working
		(7)	

10.(a)(i) Pink	B1	
(a)(ii) 0	B1	Accept zero or nil etc; do not accept none or impossible etc
(a)(iii) $\frac{3}{10}$ or equivalent	B2	B1 for [1 -] $\frac{4+3}{10}$ or for a numerator of 3
(b) 10	B2	B1 for 30 or for $\frac{12}{30}$ seen or for 18 seen
	(6)	
11.(a) Carmen indicated with valid explanation e.g. 'The range is smaller'.	E1	
(b) 12	B3	B1 for $(15 + 12 + 13 + 13 =) 53$ and B1 for $5 \times 13 = 65$ or for $\frac{53+\dots}{5} = 13$ or $5 \times 13 - 53$ seen
	(4)	
12.(a) $\frac{2}{3}$ $\frac{30}{45}$ $\frac{4}{6}$	B2	B1 for any two correct with none incorrect or for all 3 correct with one extra
(b) Valid explanation e.g. ' $\frac{3}{21}$ is the same as $\frac{1}{7}$ (not 3 times it).'	E1	Accept e.g. ' $3 \times \frac{1}{7} = \frac{3}{7}$ (not $\frac{3}{21}$)' or ' $\frac{3}{21} = \frac{1}{7}$ (not $\frac{3}{7}$)'
(c) $\frac{9}{12} + \frac{2}{12}$ $\frac{11}{12}$ or equivalent	M1 A1	or equivalent calculation with correct common denominator
	(5)	
13. (a) Correct shape drawn at (2, 2) (2, 4) (4, 4) (6, 2)	B2	B1 for a rotation of 90° anti-clockwise about (0, 0) or for 3 out of 4 points plotted correctly and joined
(b) Point P marked at (9, -2)	B1	Allow unlabelled if unambiguous
	(3)	
14.(a) $750 \div 300 \times 20$ or equivalent 50	M1 A1	Or $20 + 20 + 10$ or for sight of $2\frac{1}{2}$ (batches)
(b) (flour left =) $1800 - 750$ or 1050 $1050 \div 200$ or $200 \times 5 (= 1000)$ 5	M1 m1 A1	or equivalent; FT 'their $1800 - 750$ '; may be implied by e.g. 200, 400, 600, 800, 1000 Not from wrong working; an answer of 5.25 is M1 M1 A0 only.
	(5)	

15.(a) $\frac{18}{4} \times 3$ or equivalent	M1	
13.5 or equivalent	A1	Do not allow $\frac{27}{2}$ etc, as in context
(b) $48 \div (7 + 3 + 2)$	M1	May be implied by sight of 28 or 8.
$\times (7 - 2)$	m1	Or equivalent
20	A1	
	(5)	
16.(a) $100 \text{ (cm}^2\text{)}$	B1	
(b) 8	B1	
(c) $8 \div 100$ or $\frac{8}{100}$	M1	or equivalent FT 'their 100' and 'their 8'
0.08	A1	FT 'their 100' and 'their 8'
	(4)	

<p>17.(a) $\frac{360-128}{2}$ or $180-\frac{128}{2}$ (= 116)</p> <p>$\frac{180-116}{2}$</p> <p>32</p>	<p>M2</p> <p>m1</p> <p>A1</p>	<p>Or M1 for $360 - 128$ (= 232) or $128 \div 2$ (= 64)</p> <p>FT 'their 116' ; dependent on M2</p> <p><u>Alternative method using exterior angles:</u> $128 \div 2$ M1 64 is BAC + ABC seen or implied and $64 \div 2$ M2 32 A1</p>
<p>(b) Valid combination of angles/reasons</p> <p>e.g. $a = 90$ angles on a straight line $b = 90$ vertically opposite $c = 55$ angles in a quadrilateral</p> <p>or Top is parallel to middle corresponding angles $d = 55$ angles on a straight line or $e = 55$ angles on a straight line</p> <p>and completion of argument e.g. '(Parallel as) alternate angles are equal.' or 'Middle is parallel to bottom corresponding angles (so top parallel to bottom).'</p>	<p>B2</p> <p>E1</p>	<p>NB Other valid reasons are possible, but reasons based on parallel lines must be justified.</p> <p>Longer methods must be complete for B2</p> <p>B1 for two correct angles with at least one reason stated or for 3 correct relevant angles with no reasons stated and no incorrect angles seen or for showing the top is parallel to the middle or the middle is parallel to the bottom</p> <div style="text-align: center;">  </div> <p>Do not accept 'F angles' or 'Z angles' as reasons.</p>
	(7)	
18.(a)(i) 2	B1	
(a)(ii) 5	B1	
(b)(i) 8×10^7	B2	B1 for $\dots \times 10^7$ or for 80 000 000
<p>(b)(ii)</p> <p>$(3 \times 10^5 =) 300\,000$ or $(40\,000 =) 4 \times 10^4$</p> <p>$\frac{3 \times 10^5}{4 \times 10^4}$ or $\frac{300\,000}{40\,000} = 7.5$</p> <p>(so more than 7)</p>	<p>B1</p> <p>B1</p>	<p><u>Alternative method 1:</u> $7 \times 40\,000 = 280\,000$ B1 $(3 \times 10^5 =) 300\,000$ (so more than 7) B1</p> <p><u>Alternative method 2:</u> $\frac{7 \times 40\,000}{300\,000}$ M1 $\frac{280\,000}{300\,000}$ (which is less than 1) A1</p>
	(6)	

19.*(a) (£)18(.00)	B1	
(b)(i) They are in direct proportion indicated	B1	
(b)(ii) 4.5 The cost (in £) per mile	B2 B1	B1 for $\frac{45}{10}$ or equivalent or equivalent Allow £ per mile NB An answer of £4.5(0) per mile earns 3 marks
	(5)	
20.*(a) Correct line of best fit	B1	Following trend with some points above and below 
(b) Answer in the range 7.5 to 8 (kg)	B1	Or FT their line for an answer outside this range
(c) No with valid reason e.g. 'It is too tall' or 'A dog of mass 8.2 kg should have a height of about 27.5 cm'	E1	Allow e.g. 'For a dog of 35 cm, 8.2 kg is not heavy enough.' or 'Its height does not match its weight.' Allow e.g. 'It is too far off the line of best fit.' provided B1 has been awarded in (a).
	(3)	
21. (BC =) 5 $12^2 + 5^2 (= 169)$ $x^2 = 169$ or $x = \sqrt{169}$ (x =) 13	B1 M1 A1 A1	FT 'their 5' FT 'their 5' FT from M1, if possible, for the correctly evaluated square root of 'their 169' provided 'their answer' > 12. Accept an unsupported 13 (cm) If no marks award SC1 for sight of $AC = \frac{1}{2} \times PR$ or equivalent Alternative method: $24^2 + 10^2 (= 676)$ M1 $x^2 = 676$ or $x = \sqrt{676}$ A1 (PR =) 26 A1 (x =) 13 B1
	(4)	

<p>22.* 5 park keepers pruning after 1 hour</p> <p>10 trees left to prune</p> <p>Fully correct method in steps or statements e.g.</p> <table border="1" data-bbox="188 450 624 577"> <thead> <tr> <th>P/keepers</th> <th>Hours</th> <th>Trees</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>2</td> <td>6</td> </tr> <tr> <td>1</td> <td>2</td> <td>2</td> </tr> <tr> <td>5</td> <td>2</td> <td>10</td> </tr> </tbody> </table> <p>2 (hours)</p> <p>3 (hours)</p>	P/keepers	Hours	Trees	3	2	6	1	2	2	5	2	10	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>seen or implied</p> <p>seen or implied</p> <p>seen or implied; FT 'their derived 10' or $2 \times \frac{3}{5} \times \frac{10}{6}$</p> <p>Allow equivalent working in minutes</p> <p>Seen or implied</p> <p>FT 'their 2' provided M1 has been awarded</p>
P/keepers	Hours	Trees												
3	2	6												
1	2	2												
5	2	10												
	(5)													
<p>23.*(a) $(x-3)(x+5)$</p>	B2	B1 for $(x \dots 3)(x \dots 5)$												
<p>(b) 3, -5</p>	B1	Correct or correct FT; FT 'their $(x \pm a)(x \pm b)$ ' from (a)												
	(3)													

<p>24.*(a) $x = -1.6$ or -1.7</p> <p>$y = 1.3$ or 1.4</p>	<p>B1</p> <p>B1</p>	<p>If no marks then SC1 for a value of x between -1.6 and -1.7 and a value of y between 1.3 and 1.4 or for correct values given as coordinates</p>
<p>(b) $2a + 3c = 72$ and $3a + c = 66$</p> <p>Method to eliminate an unknown e.g. equal coefficients and subtraction</p> <p>Finds one unknown</p> <p>Finds the other unknown</p> <p>(£)15(.00)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>B1</p>	<p>May use other letters or words throughout this part</p> <p>FT their equations provided one is correct and the other is linear in the same pair of unknowns or rearranges one equation and substitutes into the other</p> <p>Allow one error in one term, not in the equated coefficients</p> <p>CAO; $a = 18$ or $c = 12$</p> <p>FT 'their a' or 'their c' used in one of their equations</p> <p>FT $2(\text{'their derived } a') + 2(\text{'their derived } c') - 45$ provided $2(\text{'their derived } a') + 2(\text{'their derived } c')$ is greater than 45</p>
		<p><u>Alternative method:</u> Adult ticket costs £18, child ticket costs £12 found using trials <i>B4</i> (£)15(.00) FT $2(\text{'their derived } a') + 2(\text{'their derived } c') - 45$ provided $2(\text{'their derived } a') + 2(\text{'their derived } c')$ is greater than 45 <i>B1</i></p>
	<p>(7)</p>	

<p>25.* (Proportion of tagged fish in sample is) $\frac{10}{100} \left(= \frac{1}{10} \right)$ or equivalent or (Proportion of sample tagged is) $\frac{10}{50}$ or equivalent $\frac{10}{50} = \frac{100}{500}$ or $\frac{10}{100} = \frac{50}{500}$ or 20% (of population) is 100 (fish) or equivalent</p> <p>500 (fish) and do not allow fishing ticked or indicated</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow for e.g. '10 tagged out of 50'</p> <p>Implies the first M1; allow for e.g. '100 tagged out of 500'; allow $\frac{100}{x} = \frac{10}{50}$ or $\frac{50}{x} = \frac{10}{100}$ or equivalent to score M1 M1</p> <p>CAO</p>
<p>(3)</p>		