Pearson Edexcel

Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE In Mathematics A (4MA1) Paper 2F

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
  Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Types of mark

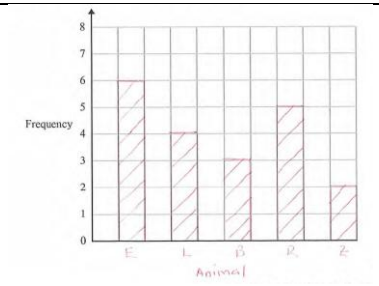
- M marks: method marks
- A marks: accuracy marks
- B marks: unconditional accuracy marks (independent of M marks)

Abbreviations

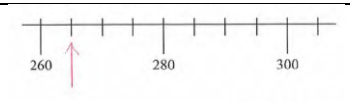
- cao – correct answer only
- ft – follow through
- isw – ignore subsequent working
- SC - special case
- oe – or equivalent (and appropriate)
- dep – dependent
- indep – independent
- eeoo – each error or omission

- **No working**
  If no working is shown then correct answers normally score full marks
  If no working is shown then incorrect (even though nearly correct) answers score no marks.
- **With working**
  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.
  If a candidate misreads a number from the question. Eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.
  If there is a choice of methods mark the one that leads to the answer on the answer line. If there is no answer given then mark the method that gives the lowest mark and award this mark.
  If there is no answer on the answer line then check the working for an obvious answer.
- **Ignoring subsequent work**
  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.
  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.
  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.
- **Parts of questions**
  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

International GCSE Maths					
Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.					
Question	**Working**	**Answer**	**Mark**	**Notes**	
1 (a)		Venezuela	1	B1	Allow incorrect spelling if meaning is clear. Allow V Accept the numerical answer 926 690 May be written as eg 926, 690
(b)		one hundred (and) sixty three thousand (and) eight hundred	1	B1	Allow incorrect spelling if meaning is clear.eg hunder/hudred, sixety/sisty for sixty etc
(c)		(7) hundreds circled	1	B1	(7) hundreds clearly indicated with no other words indicated
(d)		174 000	1	B1	Allow 'one hundred and seventy-four thousand' or 174 thousand
(e)		582 474	1	B1	
					Total 5 marks

Question		Working	Answer	Mark	Notes	
2*	(a)	elephant – 6 lion – 4 buffalo – 3 rhinoceros – 5 zebra - 2	Correct list of frequencies 6, 4, 3, 5, 2	2	B2	for all correct frequencies (ignore tally column) (B1 for 3 or 4 correct frequencies or for 4 or 5 tallies correct but not totalled or for frequencies written as probabilities with 3 or 4 or 5 correct numerators)
	(b)		A correctly labelled bar chart	3	B2 B1	B2ft for all 5 correct bars, ft their figures (Do not follow through 0) (B1ft for 3 or 4 correct bars, ft their figures, (Do not follow through 0) or for 5 correct indications of heights, eg, cross, dot, etc. (Do not follow through 0)) NB Condone gaps of different widths or no gaps between bars and also bars of different widths B1 for all 5 bars labelled – use of initials or a key is acceptable
						Total 5 marks

Question		Working	Answer	Mark	Notes	
3	(a)		$4d$	1	B1	allow $d4$
	(b)		w^5	1	B1	cao
	(c)		7	1	B1	cao
	(d)		$10r + 5y$	2	B2	for $10r + 5y$ (B1 for $10r$ or for $(+)5y$)
						Total 5 marks

Question		Working	Answer	Mark	Notes
4*	(a)		75.2	1	B1 Allow $75\frac{1}{5}$ oe
	(b)		A clear indication of marking the first notch after 260	1	B1 cao
					Total 2 marks

Question		Working	Answer	Mark	Notes
5	(a)		(–2, 3)	1	B1
	(b)		*T* clearly marked	1	B1 A point clearly marked at (3, –1) need not be labelled if meaning is clear
	(c)		(2, 1)	2	B2 B1 for (2, *X*) or (*Y*, 1) or (1, 2) or the midpoint unambiguously marked in the correct place on the diagram
					Total 4 marks

Question		Working	Answer	Mark	Notes
6	(a)		$3\frac{4}{5}$	1	B1
	(b)		$\frac{4}{5}, \frac{28}{35}$	1	B1 Both fractions and no other fraction circled or clearly indicated in the list
	(c)		$\frac{3}{10}$	1	B1 oe fraction
					Total 3 marks

Question	Working	Answer	Mark	Notes
7	2.25 ÷ 3 (= 0.75) or 225 ÷ 3 (= 75) or $\frac{2}{3}\times 2.25\left(=1.5(0)\right)$ or $\frac{2}{3}\times 225(=150)$ or $6c+15d=13.5(0)$ **and** $6c=4.5(0)$ oe or $6c+15d=1350$ **and** $6c=450$ oe		4	M1 for a correct method to find the cost of 1 cupcake Allow $\frac{1}{3}=0.33...$ or $\frac{2}{3}=0.66...$ truncated or rounded or for setting up two equations where the coefficients of *c* are equal *c* = cupcakes and *d* = doughnuts or the use of 2 different letters (may not be defined)
	4.50 – 2 × "0.75" (= 3) or 450 – 2 × "75" (= 300) or 15*d* = 9 oe or 15*d* = 900 oe			M1 for a correct method to find the cost of the 5 doughnuts or for finding an equation for *d*
	"3" ÷ 5 or "300" ÷ 5 (= 60) or 9 ÷ 15 or 900 ÷ 15 (= 60)			M1 for a correct method to find the cost of 1 doughnut
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	0.6(0)		A1 or $ crossed out and 60 cents SCB2 for 4.50 – 2(3 ÷ 2.25) (= 1.83...) **and** "1.83..." ÷ 5 (= 0.36…) OR 450 – 2(3 ÷ 225) (= 449.9...) **and** "449.9…" ÷ 5 (= 89.9…) SCB1 for 4.50 – 2(3 ÷ 2.25) (= 1.83...) OR 450 – 2(3 ÷ 225) (= 449.9...)
				Total 4 marks

Question	Working	Answer	Mark	Notes
8	*DBC* = 104 or 180 – 104 (= 76)		3	M1 for correctly finding *DBC* or *EBC* or *ABD* May be seen on the diagram This is not awarded if the angles are incorrectly assigned (Ignore incorrect angles on the diagram if a student shows 38 on the answer line)
	$\frac{180-104}{2}$ oe or $\frac{76}{2}$ oe			M1
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	38		A1 cao
				Total 3 marks

Question	Working	Answer	Mark	Notes
9*	(2 litres =) 2000 (millilitres) **or** (180 millilitres =) 0.18 (litres)		4	B1 Can be implied from correct working
	eg 2000 ÷ 180 oe **or** 2 ÷ 0.18 oe **or** 11(.111….) **or** $\frac{100}{9}$ or $11\frac{1}{9}$ or 180, 360, 540, 720, …. 1800, 1980 or 2000, 1820, 1640, 1460 …. 200, 20			M1 ft their millilitres ÷ 180 **or** 2 ÷ their litres for this mark NB Repeated subtraction must continue to a number less than 180 eg 200 ÷ 180 or 200 – 180 gains this mark only eg 500 ÷ 180 or 500 – 180 – 180 gains this mark only eg 2 ÷ 1.8 or 2 – 1.8 gains this mark only Allow one arithmetic error for repeated addition or repeated subtraction for this mark
	11 × 180 (= 1980) or 11 × 0.18 (= 1.98) or 180, 360, 540, 720, …. 1800, 1980 or 2000, 1820, 1640, 1460 …. 200, 20			M1 dep on B1 or for an answer of 0.02 No errors allowed for repeated addition or repeated subtraction for this mark
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	20		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
10* (a)		A correct reason	1	B1 He should have got 30 + 20 oe The answer should be 50 oe −4 ×−5 = (+) 20 oe Minus and minus gives a positive oe etc
(b)		1, 3, 5, 7, 9	2	B2 for 1, 3, 5, 7, 9 with no extras (in any order) (B1 for four correct values with no more than one incorrect or for five correct values with no more than one incorrect)
				Total 3 marks

Question	Working	Answer	Mark	Notes
11 (a)	<table><tr><th></th><th>tennis</th><th>athletics</th><th>cricket</th><th>Total</th></tr><tr><td>**Monday**</td><td>29</td><td>23</td><td>58</td><td>110</td></tr><tr><td>**Tuesday**</td><td>33</td><td>50</td><td>47</td><td>130</td></tr><tr><td>**Total**</td><td>62</td><td>73</td><td>105</td><td>240</td></tr></table>	A correctly completed table	3	B3 (B2 for 4 or 5 correct entries B1 for 2 or 3 correct entries)
(b)		$\frac{58}{105}$	1	B1 oe 0.55(238…) or 55(.238…)% truncated or rounded
				Total 4 marks

Question	Working	Answer	Mark	Notes
12 (a)	$w+d=3y$ oe or $-3y=-w-d$ oe or $\frac{w}{3}=y-\frac{d}{3}$ oe or $\frac{w+d}{3}$ oe or $y=w+d\div 3$		2	M1 for a correct first step
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$y=\frac{w+d}{3}$		A1 oe eg $y=\frac{-d-w}{-3}$ or $y=\frac{w}{3}+\frac{d}{3}$ oe or $y=(w+d)\div 3$ (must see y = … on answer line or in working)
(b)		$T = 12b + 3p$	3	B3 for $T = 12b + 3p$ oe [accept $T = 12 \times b + 3 \times p$] B2 for $12b + 3p$ or $T = 12b + xp$ or $T = yb + 3p$ or a correct equation with other letters eg $T = 12m + 3n$ B1 for $12b + xp$ or $12b$ or $yb + 3p$ or $3p$ or $12p + 3b$ or $T = kb + cp$ where $k \neq 0$ or $k \neq 12$ and $c \neq 0$ or $c \neq 3$ Accept upper or lower case for T, b and p including a mixture of these for B3, B2 and B1
				Total 5 marks

Question	Working	Answer	Mark	Notes
13	7.79 or 11.709…. or 0.67 or 0.665 or 0.6652		2	M1
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	0.66524(4…)		A1 At least 5 sf (0.665 244 513 4 calculator value)
				Total 2 marks

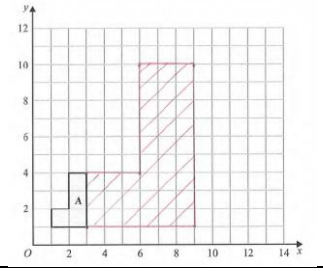
Question	Working	Answer	Mark	Notes
14	125 × 9 (= 1125) or 125 × 5 (= 625) or 9 × 5 (= 45) or 125 × 9 × 5 (= 5625) or 0.24 × 125 (= 30) or 0.24 × 9 (= 2.16) or 0.24 × 5 (= 1.2)		3	M1
	0.24 × (125 × 9 × 5) oe or 0.24 × "5625" oe or "30" × 9 × 5 oe or 125 × "2.16" × 5 oe or 125 × 9 × "1.2" oe			M1 for a complete method
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	1350		A1 SCB2 for 4275
				Total 3 marks

Question	Working	Answer	Mark	Notes
15	$2 \times \pi \times 16$ or $\pi \times$ "32"		2	M1 Allow 3.14… or $\frac{22}{7}$ for π
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	101		A1 100 to 101 NB 101 from $\pi \times 16^2$ (= 32π) scores M0A0
				Total 2 marks

Question	Working	Answer	Mark	Notes
16*	180 + 73 or 360 – (180 – 73) or 360 – 107 or 270 – (90 – 73) or 270 – 17 or 270 – (180 − 90 – 73)		2	M1 or for 73 or for 107 or for 253 seen in the correct place on the diagram by point *B* or correctly identified by labelling
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	253		A1
				Total 2 marks

Question		Working	Answer	Mark	Notes
17*	(a)	12 ÷ 4 (= 3) or 50 ÷ 4 (= 12.5) oe		2	M1 for a correct method to find the SF or a correct calculation to find the amount of cheese for one person
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	150		A1
	(b)	180 ÷ 40 (= 4.5) oe or 40 ÷ 4 (= 10)		2	M1 for a correct method to find the SF or a correct calculation to find the amount of butter for one person
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	18		A1
					Total 4 marks

Question	Working	Answer	Mark	Notes
18*		1^{st} card = 4	3	B1
		2^{nd} card = 6		B1 or a list of 6 numbers with a mode of 6
		4^{th} card = 9		B1
				SCB2 for 4, 6 and 9 in the incorrect order
				Total 3 marks

Question		Working	Answer	Mark	Notes	
19	(a)		Correct shape drawn in correct position	2	B2 Shape drawn with coordinates (3, 1), (9, 1), (9, 10), (6, 10), (6, 4), (3, 4) (B1 for a shape of the correct size but in the wrong position) NB Overlay is available	
	(b)	'Turn' is not sufficient	Rotation	3	B1 with no mention of any other transformation words or move, flip, transform, up, right etc	B2 for enlargement SF –1 (Ignore any reference to clockwise or anticlockwise)
			180°		B1 allow 'half turn'	
			(centre) (5, 5)		B1 must be a coordinate and not a vector	
						Total 5 marks

Question	Working	Answer	Mark	Notes
20	$\frac{22}{3}(-)\frac{25}{7}$ or $(7)\frac{7}{21}(-)(3)\frac{12}{21}$ or $(7)\frac{7a}{21a}(-)(3)\frac{12a}{21a}$		3	M1 for correct improper fractions or fractional part of numbers written correctly over a common denominator
	$\frac{154}{21}-\frac{75}{21}$ or $\frac{22\times7}{21}-\frac{25\times3}{21}$ or $\frac{22\times7-25\times3}{21}$ $\frac{154a}{21a}-\frac{75a}{21a}$ or $7\frac{7}{21}-3\frac{12}{21}=4-\frac{5}{21}$ oe or $7\frac{7}{21}-3\frac{12}{21}=6\frac{28}{21}-3\frac{12}{21}$			M1 for correct fractions with a common denominator with minus sign or mixed numbers to the stage shown $\frac{154}{21}-\frac{75}{21}$ or $\frac{22\times7}{21}-\frac{25\times3}{21}$ implies the first M1
	$\frac{154}{21}-\frac{75}{21}=\frac{79}{21}=3\frac{16}{21}$ or $4-\frac{5}{21}=3\frac{16}{21}$ or $7\frac{7}{21}-3\frac{12}{21}=6\frac{28}{21}-3\frac{12}{21}=3\frac{16}{21}$ *Working required*	A fully correct solution shown		A1 Dep on M2 for a correct answer from fully correct working If a student shows that $3\frac{16}{21}=\frac{79}{21}$ then they must show correct working to $\frac{79}{21}$ and can gain full marks for this
				Total 3 marks

Question	Working	Answer	Mark	Notes
21*		Bisector with construction arcs	2	B2 B2 for a fully correct perpendicular bisector with 2 pairs of intersecting arcs shown (the line and the arcs can intersect on or within the overlay guidelines) (B1 for 2 pairs of intersecting arcs and no perpendicular bisector drawn or for a correct perpendicular bisector drawn within or on guidelines but no arcs or insufficient arcs or one pair of intersecting arcs and perpendicular bisector drawn on just one side of *AB*) NB Overlay is available
				Total 2 marks

Question	Working	Answer	Mark	Notes
22* (a)	$\frac{10}{4}\left(=\frac{5}{2}=2.5\right)$ or $\frac{4}{10}\left(=\frac{2}{5}=0.4\right)$ or $\frac{x}{5}=\frac{10}{4}$ oe or $\frac{x}{10}=\frac{5}{4}$ oe		2	M1 for a correct SF can be expressed as a fraction, decimal or ratio (may or may not be used) or for a correct equation in x Allow any letter for x
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	12.5		A1 oe eg $\frac{50}{4}$ or $\frac{25}{2}$ or $12\frac{1}{2}$ or $12\frac{2}{4}$
(b)	24 ÷ [2.5] oe or $\frac{y}{24}=\frac{4}{10}$ oe or $\frac{y}{24}=\frac{5}{[12.5]}$ oe or $\frac{y}{4}=\frac{24}{10}$ oe or $\frac{y}{5}=\frac{24}{[12.5]}$ oe		2	M1 ft ie [2.5] is their SF from (a) or for a correct equation in y Allow any letter for y ft their answer to (a) ie [12.5] is their answer to (a)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	9.6		A1 oe eg $\frac{48}{5}$ or $9\frac{3}{5}$ If (a) x = 9.6 and (b) y = 12.5 then M1A0M1A0
				Total 4 marks

Question	Working	Answer	Mark	Notes
23*	240 ÷ (3 + 4 + 5) (= 20) or $240\times\frac{3}{3+4+5}\left(=60\right)$ oe or $240\times\frac{4}{3+4+5}\left(=80\right)$ oe or $240\times\frac{5}{3+4+5}\left(=100\right)$ oe		4	M1 for a correct method to find the value of one share NB (240 ÷ 3 =) 80, (240 ÷ 4 =) 60 and (240 ÷ 5 =) 48 scores M0
	For two of (Pau:) 3 × "20" + 10 + 10 (= 80) or "60" + 10 + 10 (= 80) (Sam:) 4 × "20" – 10 (= 70) or "80" – 10 (= 70) (Tia:) 5 × "20" – 10 (= 90) or "100" – 10 (= 90)			M1 for the correct values for 2 of the people after S and T give P £10
	80, 70 and 90 or eg 9 : 7 : 8 oe or eg 4 : 3.5 : 4.5 oe			M1 for all 3 of 80, 70, and 90 correct (ignore units) or for the correct values for the final ratio in the wrong order (ignore units) or for the correct values for the final ratio unsimplified (ignore units)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	8 : 7 : 9		A1 other orders are acceptable if labelled correctly on the answer line or working
				Total 4 marks

Question	Working	Answer	Mark	Notes	
24*	0.07 × 4000 (= 280) **or** 1.07 × 4000 (= 4280)		3	M1 for finding 7% of 4000 or 107% of 4000	M2 for $1.07^3 \times 4000$ or $1.07^4 \times 4000$ (= 5243….)
	4000 + "280" (= 4280) oe **and** 0.07 × "4280" (= 299.6) **and** "4280" + "299.6" (= 4579.6) **and** 0.07 × "4579.6" (= 320.572) **or** "280" + "299.6" + "320.572" (= 900(.172))			M1	
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	4900		A1 allow answers in the range 4900 – 4901 If no other mark awarded, SCB1 for 4000 × 0.07 × 3 (= 840) or 4000 × 0.21 (= 840) or 4000 + 4000 × 0.07 × 3 (= 4840) or 4000 × 1.21 (= 4840) or 0.93 × 4000 (= 3720) or 0.79 × 4000 (= 3160) or $0.93^3 \times 4000$ (= 3217…) or 4000×1.07^2 (= 4579…)	
					Total 3 marks

Question	Working		Answer	Mark	Notes	
25*	eg $3x + 5y = 8$_ $20x + 5y = -17.5$ **Subtracting** ($3x - 20x = 8 - -17.5$ or $-17x = 25.5$) **or** $3x + 5(-3.5 - 4x) = 8$ **or** $4x + \frac{8-3x}{5} = -3.5$	eg $12x + 20y = 32$_ $12x + 3y = -10.5$ **Subtracting** ($20y - 3y = 32 - -10.5$ or $17y = 42.5$) **or** $3\left(\frac{-3.5-y}{4}\right) + 5y = 8$ **or** $4\left(\frac{8-5y}{3}\right) + y = -3.5$		3	M1	for a correct method to eliminate x or y: coefficients of x or y the same **and** correct operator to eliminate selected variable (condone any one arithmetic error in multiplication) **or** writing x or y in terms of the other variable and correctly substituting (condone missing brackets) NB The mark is for the method and not for the result of the method. However, if the correct result of the method is seen, the mark can be awarded.
	$3\times\text{“}-1.5\text{”} + 5y = 8$ **or** $4 \times \text{“}-1.5\text{”} + y = -3.5$ **or** $y = -3.5 - 4\times\text{“}-1.5\text{”}$ **or** $y = \frac{8-3\times"-1.5"}{5}$	$3x + 5 \times \text{“}2.5\text{”} = 8$ **or** $4x + \text{“}2.5\text{”} = -3.5$ **or** $x = \frac{-3.5-"2.5"}{4}$ **or** $x = \frac{8-5\times"2.5"}{3}$			M1	dep on first M1 for a correct method to find other variable by substitution of found variable into one equation **or** for repeating the above method to find the second variable.
	Working required		$x = -1.5$ $y = 2.5$		A1	oe dep on M1
						Total 3 marks

Question	Working	Answer	Mark	Notes
26* (a)	$-3t - 2t < 15 - 7$ or $-5t < 8$ oe or $7 - 15 < 2t + 3t$ or $-8 < 5t$ oe or $t = -1.6$ or $t < -1.6$		2	M1 for correctly isolating terms in t on one side and number terms on the other side (use of = or any inequality symbol or variable is permitted)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$t > -1.6$		A1 oe eg $-1.6 < t$ or $t > -\frac{8}{5}$ or $-\frac{8}{5} < t$ oe Must have correct inequality symbol on answer line NB Sight of correct answer in working space and just $(t =) -1.6$ oe on answer line gains M1 only
(b)		$x \geq 2$	3	B1 oe allow $x > 2$ or $2 < x$
		$y \geq 3$		B1 oe allow $y > 3$ or $3 < y$
		$x + y \leq 9$		B1 oe allow $x + y < 9$ or $y < 9 - x$ or $9 > x + y$ SC B2 for all of $x \leq 2$, $y \leq 3$, $x + y \geq 9$ oe or $x < 2$, $y < 3$, $x + y > 9$ SC B1 for all of $x = 2$, $y = 3$, $x + y = 9$ oe
				Total 5 marks

Q	Working	Answer	Mark	Notes
27	$(AC^2 =)12^2+16^2\ (=144+256=400)$ **or** $(BAC=)\tan^{-1}\left(\frac{12}{16}\right)(=36.8(698...))$ **or** 36.9 **or** $(BCA=)\tan^{-1}\left(\frac{16}{12}\right)(=53.1(301...))$		5	M1 for a correct method using triangle *ABC*
	$(AC=)\sqrt{12^2+16^2}\left(=\sqrt{144+256}=\sqrt{400}=20\right)$ **or** $(AC=)\frac{16}{\cos"36.8"}(=20)$ **or** $(AC=)\frac{12}{\sin"36.8"}(=20)$ **or** $(AC=)\frac{16}{\sin"53.1"}(=20)$ **or** $(AC=)\frac{12}{\cos"53.1"}(=20)$			M1 for a correct method to find *AC*
	$(BD^2=)(1.5\times"20")^2-16^2(=644)$ **or** $(BD^2=)30^2-16^2\ (=900-256=644)$ **or** $(BAD=)\cos^{-1}\left(\frac{16}{"30"}\right)(=57.7(690...))$ **or** 57.8 **or** $(BDA=)\sin^{-1}\left(\frac{16}{"30"}\right)(=32.2(309...))$ **or** $(BCA=)\sin^{-1}\left(\frac{16}{"20"}\right)(=53.1(301...))$ **and** $\frac{(CD)}{\sin(180-126.9-32.2)}=\frac{"30"}{\sin(180-53.1)}$ oe			M1 for a correct method using triangle to find BD^2 or angle *BAD* or angle *BDA* or for a correct equation for side *CD*
	$(BD=)\sqrt{(1.5\times"20")^2-16^2}$ $(=25.3(771)\ldots)$ **or** $(BD=)\sqrt{30^2-16^2}\left(=\sqrt{900-256}=\sqrt{644}=2\sqrt{161}=25.3(771...)\right)$ **or** $(BD=)16\times\tan"57.7"(=25.3(771...))$ **or** $(BD=)"30"\times\sin"57.7"(=25.3(771...))$ **or** $(BD=)\sqrt{16^2+"30"^2-2\times16\times"30"\times\cos"57.7"}(=25.3(771...))$ **or** $(BD=)30\times\cos"32.2"(=25.3(771...))$ **or** $(BD=)\frac{16}{\tan"32.2"}(=25.3(771...))$ **or** $(BD=)\frac{16}{\sin"32.2"}\times\sin"57.7"(=25.3(771...))$ **or** $(CD=)\frac{"30"}{\sin"126.9"}\times\sin"20.9"$ oe			M1 for a correct method to find *BD* or *CD*
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	13.4		A1 awrt 13.4
				Total 5 marks

Question	Working	Answer	Mark	Notes
28	(17 + 28) ÷ (9 – 4) or 45 ÷ 5 or $1-\frac{4}{9}\left(=\frac{5}{9}\right)$ or $(17+28=)\frac{5}{9}$ oe or $\frac{p}{p+28+17}=\frac{4}{9}$ oe or $\frac{p}{p+45}=\frac{4}{9}$ or $\frac{m-45}{m}=\frac{4}{9}$		3	M1 Allow 0.55(555…) or 55(.555…)% truncated or rounded
	(17 + 28) ÷ 5 × 4 or 45 ÷ 5 × 4 or $(17+28)\div"\frac{5}{9}"(=81)$ or $45\div"\frac{5}{9}"(=81)$ or $(17+28)\times"\frac{9}{5}"(=81)$ or $45\times"\frac{9}{5}"$ (= 81) or (17 + 28) ÷ 5 × 4 or 45 ÷ 5 × 4 or $"\frac{5}{9}"=\frac{17+28}{n}$ oe or n = 81 or $9p=4(p+28+17)$ or $9p-4p=180$ oe or $5p=180$ oe or $9(m-45)=4m$ or $9m-4m=405$ oe or $5m=405$ oe or m = 81			M1 for the correct calculation for the total number of counters or for the correct calculation for the number of orange counters or for the correct equation for the total number of counters (removing the denominators) or for the correct equation for the number of orange counters (removing the denominators)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	36		A1 cao
				Total 3 marks