PIE CHART

Pearson Edexcel - Tuesday 11 June 2019 - Paper 3 (Calculator) Higher Tier

1.

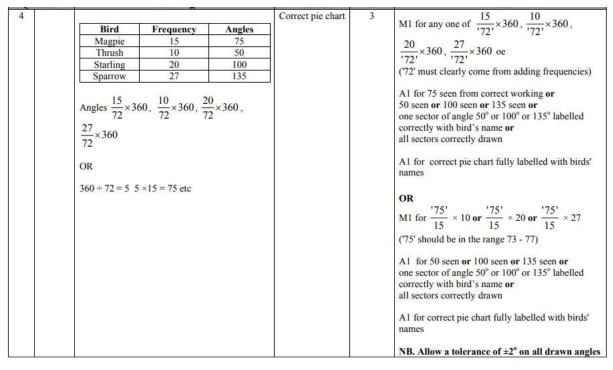| 21	210	M1	for method to find total frequency, $60 \times 2 (= 120) + 30 \times 5 (= 150) + 30 \times 9 (= 270) + 15 \times 6 (= 90) + 45 \times 2 (= 90)$ or 720 **OR** for method to find the total area, $4 + 5 + 9 + 3 + 3 (= 24 \text{ cm}^2)$	Accept one error in total for the award of the method marks 24 must be from adding areas of bars not heights of bars
		M1	for finding the number of onions less than 60g or greater than 120 g = $120 + 90 + 90 (= 300)$, **OR** for finding the number of onions between 60g and 120g $= 150 + 270 (= 420)$ **OR** for finding the area under the graph less than 60 or greater than 120 $= 4 + 3 + 3 (= 10 \text{ cm}^2)$ **OR** for finding the area under the graph between 60 and 120 $= 5 + 9 (= 14 \text{ cm}^2)$	14 must be from adding areas of bars not heights of bars
		M1	(dep M2) for $1 - \frac{"300"}{"720"} (= \frac{7}{12})$ oe OR for $\frac{"420"}{"720"} (= \frac{7}{12})$ oe OR for $\frac{"14"}{"24"} (= \frac{7}{12})$ oe	Accept 58.3...%
		A1	cao	

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2.

11		0.119	P1	for starting the process, eg finds area 25π or 16π oe, or finds angle for town A, $0 - 19 (70°)$, may be on diagram
			P1	for a complete process, eg $\frac{70}{360} \times \frac{25\pi}{41\pi}$
			A1	$0.118 - 0.119$ or $11.8\% - 11.9\%$

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3.

4			Correct pie chart	3	M1 for any one of $\frac{15}{'72'}\times 360$, $\frac{10}{'72'}\times 360$, $\frac{20}{'72'}\times 360$, $\frac{27}{'72'}\times 360$ oe

Bird	Frequency	Angles
Magpie	15	75
Thrush	10	50
Starling	20	100
Sparrow	27	135

Angles $\frac{15}{72}\times 360$, $\frac{10}{72}\times 360$, $\frac{20}{72}\times 360$, $\frac{27}{72}\times 360$

OR

$360 \div 72 = 5$ $5 \times 15 = 75$ etc

('72' must clearly come from adding frequencies)

A1 for 75 seen from correct working **or**
50 seen **or** 100 seen **or** 135 seen **or**
one sector of angle 50° or 100° or 135° labelled correctly with bird's name **or**
all sectors correctly drawn

A1 for correct pie chart fully labelled with birds' names

OR

M1 for $\frac{'75'}{15}\times 10$ **or** $\frac{'75'}{15}\times 20$ **or** $\frac{'75'}{15}\times 27$

('75' should be in the range 73 - 77)

A1 for 50 seen **or** 100 seen **or** 135 seen **or**
one sector of angle 50° or 100° or 135° labelled correctly with bird's name **or**
all sectors correctly drawn

A1 for correct pie chart fully labelled with birds' names

NB. Allow a tolerance of ±2° on all drawn angles

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4.

	Alternative method 1		
	360 – 110 or 250 or 360 – 110 – 110 or 140	M1	May be seen on diagram oe
	3360 ÷ their 140 or 24 or 2640 (men) or 6000 (women)	M1dep	their 140 must be from 360 – 110 – 110 oe
	8640	A1	SC2 4838 or 4839
	Alternative method 2		
10	$100 - \dfrac{110}{360} \times 100$ or $100 - 30.5(...)$ or $100 - 30.6$ or 69.4(...%) or 69.5(%) or $100 - \dfrac{110}{360} \times 100 - \dfrac{110}{360} \times 100$ or $100 - 30.5(...) - 30.5(...)$ or $100 - 30.6 - 30.6$ or 38.8(...%) or 38.9(%)	M1	May be seen on diagram oe
	3360 ÷ (their 69.4 – their 30.5) or 3360 ÷ their 38.8(...) or 86.4	M1dep	their 69.4 must be from $100 - \dfrac{110}{360} \times 100$ their 30.5 must be from $\dfrac{110}{360} \times 100$
	8640	A1	SC2 4838 or 4839

Alternative method 3 and Additional Guidance continue on the next page

	Alternative method 3		
10 cont	$\dfrac{250}{360}x - \dfrac{110}{360}x = 3360$ or $m = \dfrac{110}{360} \times (m + 3360 + m)$ or $w = \dfrac{250}{360} \times (w + w - 3360)$	M1	Sets up a correct equation to work out total (x), men (m) or women (w) oe
	$x = 3360 \div \left(\dfrac{250 - 110}{360} \right)$ or $m = 336\,000 \div 140$ or 2640 or $w = 840\,000 \div 140$ or 6000	M1dep	oe
	8640	A1	SC2 4838 or 4839
	Additional Guidance		
	Condone 8639.9… → answer 8640		M2 A1
	2640 or 6000		M2
	4838 and 4839 come from 3360 women		SC2