

1)	Median line drawn at 38	B1	±½ square
	Quartiles drawn at 33.5 and 42 and box drawn.	B1	±½ square
	Whiskers drawn from the box to 26 and 54	B1	±½ square
(a)	Alternative method 1		
	States their 2015 median and makes a comparison in context eg The median was 38 in 2015 so the 2015 times were quicker (on average) (due to lower median) eg the median in 2015 was one minute less than 2014 so 2015 times were quicker		
	Works out both IQR's and compares consistency 2014 interquartile range = 13 2015 interquartile range = their upper quartile – their lower quartile and 2015 times are more consistent (due to lower IQR)	B2 ft	oe ft 10(a) B1 states their 2015 median (with no comparison or incorrect comparison) or B1 incorrect reading of their median with correct comparison eg plots the median at 38 but reads as 36 and states that the times in 2015 were faster
(b)	Alternative method 2 (adds a boxplot for 2014)	<u>or</u> B2ft	ft their boxplot oe B1 correct IQR's ft their box plot or B1 incorrect readings used for 2015 IQR with correct comparison -must use correct method for 2014 IQR ie. 13 seen or 45 – 32
	Boxplot drawn for 2014 and median indicated as higher in 2014 or lower in 2015 and 2015 times were quicker (on average) (due to lower median)		
	Both quartiles marked on the boxplot for 2014 and states box smaller/narrower in 2015 2015 times are more consistent (due to lower IQR)	B2ft	ft their 10a boxplot oe

2)	8(a)	Number the ducks	B1	oe
		Use random numbers (to obtain 3 values in range)	B1	Oe put numbers in a hat and pick 3 out
(b)(i)		Ticks Muscovy duck	B1	
		Other ducks are lighter than that	B1dep	oe
(b)(ii)		sight of 25%, $\frac{1}{4}$ or 0.25	M1	oe e.g halving twice or dividing by 4
		15	A1	SC1 45

3)	(a)(i)	Mean = 9	B1	
	(a)(ii)	$\sqrt{\frac{2554}{30} - 9^2}$ 2.0678 ... 2.07	M1 A1	$\sqrt{\frac{124}{30}}$ 3 sf or better (2.0 without working no marks) (2.1 without working no marks) Condone 2.03(306...) or better
	(b)	On average more seeds germinated when placed 2cm apart. The number of seeds that germinated when planted touching each is more consistent than those that were planted 2cm apart.	B1 B1	oe which mean is greater 2cm apart oe eg less variable not sd < which sd must be clear less spread less dispersion <u>not</u> wider range
	TOTAL		5	

7

5

Homework 16 – Solutions

4) (a)	$\pounds 2251 = 158\%$ of cost in 2010	B1		If used correctly
	Cost in 2010 = $\pounds 2251 \times \frac{100}{158}$	M1		Need 100 unless answer corrects
	= $\pounds 1424.68$	A1	3	Accept $\pounds 1424$, $\pounds 1425$ SC2 $\pounds 1424.69$
(b)	Minimum cost is $\pounds 825$	B1	1	
	Total		4	

ion	Solution	Mark	Total	Comment
	NI is levied on $\pounds 397 - \pounds 166$	M1	4	
	= $\pounds 231$	A1		
	NI charged is $\pounds 231 \times \frac{12}{100}$	M1 Dep on M1		
	= $\pounds 27.72$	A1		
	Total		4	Eg $\pounds 397 \times \frac{12}{100}$ [47.64] etc is no marks

6) Attempt at cumulative frequency	M1	4, 4 + 7, (oe)
Cumulative frequencies all correct 4, 11, 22, 56, 88, 100	A1	
Plotted at upper class bounds	A1 ft	Accept 39 - 40 inclusive etc Must be an increasing graph
Their cumulative frequencies plotted and joined	A1 ft	Must be an increasing graph Curve or polygon
Their estimate, x , worked out correctly from their graph in the range $66 \leq x < 70$	A1 ft	Answer only with no graph is zero Max M1A1 from table
Any attempt at a histogram	M1	Minimum is two joined rectangles
Heights and widths correct	A1	Using frequencies (or frequency density)
Halves total frequency (sight of 50)	B1 Dep	Dep on attempt at histogram
Identifies rectangle containing 50th value	M1 Dep	Any indication Dep on attempt at histogram
Their estimate, x , worked out correctly from their graph in the range $66 \leq x < 70$	A1	Answer only with no graph is zero

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	Solution	Marks	Total	Comments																
7) (a)	Interest is 0.6% or 0.006 times debt New debt is old debt + 0.006 of old debt which is 1.006 of old debt	E1 E1	2																	
(b)	<table border="1" data-bbox="1135 347 1477 575"> <thead> <tr> <th>n</th> <th>A_n</th> </tr> </thead> <tbody> <tr><td>0</td><td>$\pounds 120\,000$</td></tr> <tr><td>1</td><td>$\pounds 119\,800$</td></tr> <tr><td>2</td><td>$\pounds 119\,598.80$</td></tr> <tr><td>3</td><td>$\pounds 119\,396.39$</td></tr> <tr><td>4</td><td>$\pounds 119\,192.77$</td></tr> <tr><td>5</td><td>$\pounds 118\,987.93$</td></tr> <tr><td>6</td><td>$\pounds 118\,781.86$</td></tr> </tbody> </table>	n	A_n	0	$\pounds 120\,000$	1	$\pounds 119\,800$	2	$\pounds 119\,598.80$	3	$\pounds 119\,396.39$	4	$\pounds 119\,192.77$	5	$\pounds 118\,987.93$	6	$\pounds 118\,781.86$	B1 B1 B1		First two rows Next two rows Last two rows
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(c)	$\pounds 120\,000 - 118\,781.86$ $\pounds 1218.14$	M1 A1	2	Ft from (b)																
	Total		8																	

8

TOTAL: 44