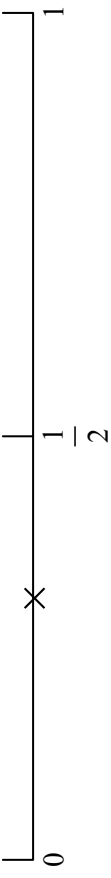
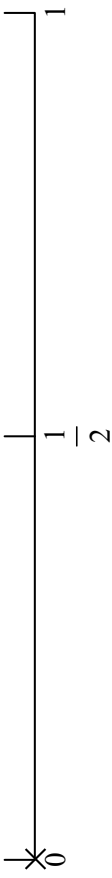
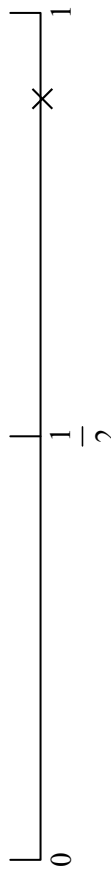


Paper 1 Foundation tier mark scheme

Question number	Answer	Additional guidance	Mark
1(a)	B1 Maths		(1)
1(b)	M1 $10 - 4$ or 3×2 A1 6		(2)
1(c)	B1 $4 + 10 + 2 + 6 [= 22]$ or 8×2 or '11' $\times 2$ B1 $22 > 20$ so yes, Milly has spent a total of more than 20 hours studying.	B1 for calculating statistic B1 for conclusion in context based on correct statistical reasoning	(2)
2(a)	B1 	B1 for $\times$ indicated between 0 and $\frac{1}{2}$ (but closer to $\frac{1}{2}$).	(1)
2(b)	B1 	B1 for $\times$ indicated at 0	(1)
2(c)	B1 	B1 for $\times$ indicated between $\frac{1}{2}$ and 1 (but closer to 1).	(1)

Question number	Answer	Additional guidance			Mark
3(a)	B1B1				(2)
		Number of times	Tally	Frequency	
		1		14	
		2		7	
		3		4	
		4		3	
		5		2	
3(b)	B1ft 1				(1)
3(c)	M1 '14' + '7' + '4' A1ft 25	M1 for the addition of correct 3 numbers from their tally chart A1 ft their tally chart			(2)
3(d)	B1 e.g. bar chart	B1 for any suitable diagram, e.g. pie chart, bar line chart			(1)

Question number	Answer	Additional guidance	Mark
4(a)	B1 e.g. Some employees may not wish to give their salary (confidential/personal).		(1)
4(b)	B1 All of the employees at the company.		(1)
4(c)(i)	B1 e.g. primary data is data you collect yourself. B1 e.g. secondary data is data collected by someone else.		(2)
4(c)(ii)	B1 e.g. known reliability, no secondary data available		(1)
4(d)	B1 Advantage: - e.g. Convenient - e.g. Equal number of males and females represented B1 Disadvantage: - e.g. Not representative - e.g. Biased - e.g. Employees coming early may have similar pay	1 st B1 any one correct advantage 2 nd B1 any one correct disadvantage	(2)

Question number	Answer		Additional guidance	Mark
5(a)	B1 $\frac{1}{4}$ oe		For probability answers accept equivalent fractions, decimals or percentages	(1)
5(b)	M1 $\frac{1}{4} \times 60$ A1 15			(2)
5(c)	M1 $\frac{9+29}{45}$ or $1 - \frac{7}{45}$, A1 $\frac{38}{45}$ oe		For probability answers accept equivalent fractions, decimals or percentages	(2)
5(d)	B2 e.g. 'reliable since the conclusion is based on a large number of spins' or e.g. 3 is scored many more times than 1 or 2		B2 for 'reliable' with supporting reason based on collected data OR B1 reliable with incomplete reasoning	(2)

Question number	Answer	Additional guidance	Mark
6(a)	B2 for median AND a correct reason, e.g. • reference to the extreme value in the female cat weights • reference to the median not being affected by extreme values OR if B2 not earned... B1 for an incomplete answer e.g. median with an attempt at a reason, OR correct reason without a conclusion OR if B1 not earned... SC B1 for mean AND uses all of the data	B2 for a complete answer assessing the appropriateness of the choice of average. OR if B2 not earned... B1 for an incomplete answer assessing the appropriateness of the choice of average.	(2)
6(b)	B2 Not suitable as the data is not bivariate/in related pairs or OR if B2 not earned... B1 Not suitable, with attempt at a reason	B2 for a complete answer assessing the appropriateness of the choice of diagram OR if B2 not earned... B1 for an incomplete answer assessing the appropriateness of the choice of diagram	(2)

Question number	Answer	Additional guidance	Mark
7(a)	B1 Bar heights of 9 and 7 drawn for action B1 Correct shading		(2)
7(b)	B1 Drama and Thriller		(1)
7(c)	B1 41		(1)
7(d)	B1B1 Any two from: • More drama films in 2014 • More comedy films in 2014 • Same number of documentary films in both years • Fewer thriller films in 2014 • Fewer action films in 2014 • More total films in 2014	B1 for each statistical conclusion. Allow equivalent converse statements.	(2)
7(e)	B1 for e.g. 'There are only two years worth of data'/'A time series graph is better for data over a longer period of time'.	B1 for appropriate reason why a time series graph would not be suitable for this data.	(1)
8(a)	B1 Diesel		(1)
8(b)	B1 Petrol		(1)
8(c)	B1 Natural gas is tallest bar on bar chart and largest sector on pie chart.		(1)
8(d)	B1 The diagrams cannot be used to support the statement. B1 The pie chart shows proportions (not amounts) oe		(2)

Question number	Answer	Additional Guidance	Mark
9	B1 B1 B1 B1 for each of four aspects from: • Understanding e.g. Questions/responses can be explained in an interview or may not be understood in a questionnaire • Candour e.g. Employee may be less open/honest in an interview or questionnaire can be done without pressure • Resources e.g. Interviewing can be time consuming/expensive or questionnaire can be done by all at the same time (or in their own time, or more cheaply) • Inclusivity e.g. interviews more likely to include all employees or questionnaires might not be returned or directors' views are not included by interview • Interviewer bias e.g. Possible bias from director (in interview)/ no interviewer bias with questionnaire	B1 for each correct comment assessing the appropriateness of the data collection methods.	(4)

Question number	Answer	Additional guidance	Mark
10	M1A1A1 for calculation of range or IQR OR for a pair of box plots drawn Range M1 74 – 40 or 70 – 43 A1 34 A1 27 OR IQR M1 65 – 53 or 63 – 53 A1 12 A1 10 B1 for e.g. The range/IQR for French presidents is greater than the range/IQR for UK prime ministers oe B1 for e.g. The ages of French presidents are more varied than the ages of UK prime ministers	M1 for a calculation of range or IQR OR for a pair of box plots drawn A1 for one correct value OR for one correct box plot A1 for second correct value to allow a comparison to be made OR for second correct box plot (same scale) to allow comparisons to be made B1 for a correct comparison of ranges or IQRs B1 for a correct contextual interpretation of comparison of spread	(5)

Question number	Answer	Additional guidance	Mark
11(a)	B1B1 for two correct reasons • e.g. data given in different formats • e.g. remove extraneous symbols • e.g. remove anomalies/outliers • e.g. data given in wrong order	B1 for each correct reason for the need to clean data on the database prior to processing it	(2)
11(b)	B1B1 for two correct aspects • e.g. large sample size increases reliability • e.g. issues due to how the data collection is carried out may decrease reliability (recorded by students and not by Kerry/students may type in information wrong) • e.g. for an example of factors that might not be consistent in the data collection which may decrease reliability (last message might not represent all text messages sent) • e.g. non-response decreases reliability	B1 for each correct comparison assessing the reliability of the conclusions drawn	(2)

Question number	Answer	Additional guidance	Mark												
12(a)	B1 3 bedrooms has the highest frequency (for any individual number of bedrooms)	Allow equivalent statistical reasoning based on the table indicating why 3 is the mode.	(1)												
12(b)	M1 $\frac{140}{1200} \times 60$ o.e. A1A1 <table><tr><td>Bedrooms</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5+</td></tr><tr><td>Houses in sample</td><td>7</td><td>15</td><td>21</td><td>12</td><td>5</td></tr></table>	Bedrooms	1	2	3	4	5+	Houses in sample	7	15	21	12	5	Accept a correct equivalent calculation shown for any one class M1 implied by one correct answer OR an indication they need 1 in 20 1 st A1 for any one value correct 2 nd A1 for all correct	(3)
Bedrooms	1	2	3	4	5+										
Houses in sample	7	15	21	12	5										
12(c)	B1 Use a sampling frame for each strata B1 Select houses randomly or generate random numbers B1 For an aspect of detail	Each category/strata to be considered separately Samples have to be random e.g. How the random numbers are obtained and used	(3)												

Question number	Answer	Additional guidance	Mark
13(a)(i)	M1 $\frac{4}{30} \times 180$ A1 = 24	Accept any equivalent calculation	(2)
13(b)	B1 e.g. 'use the mean of the sample of an estimate''	B1 for a correct explanation showing understanding that the mean of the sample represents the mean of the population	(1)
14	M1A1A1 for appropriate calculations to compare 1996 with 2006 or 1996 with 2016 e.g. Comparing index numbers M1 $\frac{23}{20} \times 100$ or $\frac{54}{20} \times 100$ A1 115 A1 270 OR Comparing prices M1 $20 \times \frac{129}{100}$ or $20 \times \frac{172}{100}$ A1 25.8 A1 34.4 B1 for e.g. from 1996 to 2006 the change/increase in price was less than the RPI B1 for e.g. from 1996 to 2016 the change/increase in price was higher than the RPI	M1 for a calculation that could be used to compare 1996 with 2006 or 2016 A1 for one correct value A1 for second correct value that allows a comparison to be made B1 for a correct contextual statement for 2006 or 2016 B1 for a correct contextual statement for 2006 and 2016	(5)

Question number	Answer	Additional guidance	Mark
15(a)(i)	M1 $\frac{11.5 + 18 + 22.3 + 13.4}{4}$		(3)
(a)(ii)	A1 16.3 B1ft Point plotted at height '16.3' between Q2 and Q3 2015		
15(b)	B1 Quarter 3 (2015)		(1)
15(c)	B1 Upwards B1 The number of visits abroad is increasing as time goes by.	B1 for a correct description of the trend B1 for a contextualised interpretation	(2)
15(d)	B1 e.g. Seasonal variation is highest in Q3/lowest in Q1 B1 e.g. More visits abroad in Q3/Fewer visits abroad in Q1	B1 for a correct comparison of one of the quarters with the others B1 for a contextualised interpretation	(2)