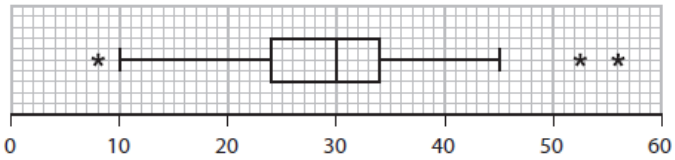
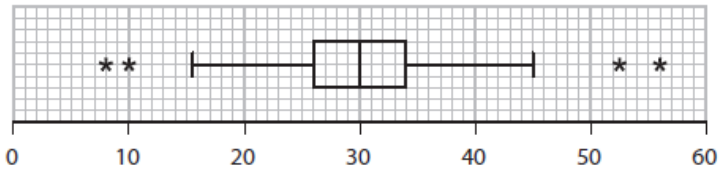
Question Number	Scheme	Marks
4. (a)	Upper quartile = 34 Lower limit = 24 – 15 = 9 or upper limit is "34" + 15 = 49 So outliers are: 8, 52.5 and 56	B1 M1 A1ft, A1ft (4)
(b)		B1 B1 B1 (3)
(c)	$Q_2 - Q_1 (= 6) > ("4" =) Q_3 - Q_2$ or e.g. in words e.g. " Q_3 closer to Q_2 than Q_1 is" So negative (skew)	M1 A1ft (2)
(d)	IQR now "34" – 26 = 8 so new outlier limits are 26 – 1.5×"8" = **14** and "34" + 1.5×"8" = **46** 	M1 A1ft A1 (3)
(e)	[Q_1 has increased so both above 24 Median same so either side of or on median] So one **between 26 and 30** inc [Q_3 unchanged so must be either side of Q_3] so one **between "34" and 45** inc	B1 B1 (2) **[14]**

	Notes
(a)	B1 for Q_3 = 34 either stated or used/implied (score if seen on box plot) M1 for one correct calculation (ft their 34 for upper limit) [May be implied by correct outliers] 2nd A1ft for the lower **outlier** at 8 (ft their limit provided limit ⩽ 12) 3rd A1ft for upper **outliers** at 52.5 and 56 (ft their limit provided it is > 45) Award if their outliers are seen on box plot **NB These accuracy marks are for the outliers not the limits**
(b)	1st B1 for a box with Q_1 = 24, Q_2 = 30 Q_3 = their 34 and two whiskers one on each side. 2nd B1 for one lower whisker ending at 10 (or their 9) and outlier at 8 only 3rd B1 for one upper whisker ending at 45 (or their 49 to match "9") and outliers at 52.5 and 56 only **SC Extra whiskers. If one set of whiskers gives a correct box plot award B1B0B0** **Usual accuracy for plots – to within 0.5 of a square.**
(c)	M1 for correct comparison of $Q_2 - Q_1$ and $Q_3 - Q_2$ (ft their Q_3) (if no values seen must see comparison otherwise accept correctly assigned 6 and 4 without >) A1ft for correct deduction based on their Q_3 (+ve (skew) if their Q_3 > 36, no skew if their Q_3=36)
(d)	M1 for recognising new IQR and at least one correct new limit (ft their 34, implied by correct plot) 1st A1ft for a correct lower whisker ending at 15.5 (or their 14) and 2 correct outliers at 8 and 10 2nd A1 for a fully correct box plot with upper whisker to 45 (or could go to 46 [to match their 14]) **SC Extra whiskers. If one set of whiskers gives a correct box plot award M1A0A1**
(e)	1st B1 for a range [26, 30] allow that (…) (o.e. eg between 26 and 30) 2nd B1 for a range [34, 45) condone […] or (…) (ft their 34 and allow o.e. e.g. between 34 and 45)