Question	Scheme	
2(a)	$\left[\sum x_B =\right] 54\times 45 - 24\times 47 \left[=1302\right]$ or $\frac{24\times 47 + 30b}{54} = 45$	M1
	$\left[\bar{x} =\right] \frac{54\times 45 - 24\times 47}{30} = 43.4$ *	A1*
		(2)
(b)	$\sqrt{\frac{66876+73826}{54} - 45^2} =$ or $\sqrt{\frac{(66876+73826) - \frac{2430^2}{54}}{54}}$	M1
	24.095…. awrt 24.1	A1
		(2)
(c)(i)	No effect as e.g. adding 2 to each does not change the variance	B1
(ii)	Increase as e.g. the total mark will increase	B1
(iii)	Decrease as e.g. the mean mark of class *B* is closer to the mean mark of class *A*	B1
		(3)
	Notes	**Total 7**
(a)	M1 for a correct method to find the total marks for class *B* or for a correct equation for *b* eg 1128 + 30*b* = 2430 but not 30*b* = 1302 on its own	
	A1* a fully correct method shown leading to 43.4 For the equation in *b* there should be 1 line of intermediate working between the equation and the given answer.	
SC:	Verification method e.g. $\frac{24\times 47 + 30\times 43.4}{54} = 45$ scores M1A0	
(b)	M1 for a correct method to find the standard deviation including root	
	A1 awrt 24.1 correct answer scores 2 out of 2 allow *s* = awrt 24.3	
(c)(i)	B1 for no effect **and** a correct reason: • Spread/variation/range or difference (in marks) remains the same o.e. • Addition has no effect/only multiplication/division affects the variance o.e. Variance not affected by coding on its own is B0	
(ii)	B1 for increase **and** a correct reason: • Total/mark/score/$\sum x$ increases o.e. • Mean of class *B* increases (by 2 marks) o.e. • Total/mark/score/$\sum x$ for class *B* increases (by 60 marks) o.e. Incorrect statements score B0 e.g. "The mean (of all 54 students) increases by 2" or e.g. "Total for class *B* increases by 48 marks" Ignore calculation if seen, but do **not** allow increases by 1.11…. on its own to score the mark here.	
(iii)	B1 for decrease **and** correct reason: • Mean/marks of class *B* now closer to mean/marks of class *A* o.e. • Values/marks/scores are closer together o.e. • Less spread/variation between values/marks/scores (for class *A* and class *B*) o.e.	