

Question	Scheme	Marks	AOs
2(a)	$\left[\bar{x} = \frac{6612}{120} \right] = \underline{55.1}$ (seconds)	B1	1.1b
		(1)	
2(b)	$[\sigma_x =] \sqrt{\frac{364902}{120} - ("55.1")^2}$ or $\sqrt{4.84}$	M1	1.1b
	$= \underline{2.2}$ (seconds)	A1	1.1b
		(2)	
2(c)	Coach <i>B</i> because standard deviation is greater	M1	2.4
	This means <i>B</i> has a greater range and therefore more extreme values	A1ft	2.2b
		(2)	

(5 marks)

Notes:
Ignore units in this question

(a)	B1	for 55.1 or $55\frac{1}{10}$ only (may be seen in the question) ISW e.g. 55.1 followed by 55 etc Do not accept $\frac{551}{10}$ that scores B0
(b)	M1	for a correct expression (values seen not just a formula)(including $\sqrt{\quad}$)
	A1	for 2.2 or $\frac{11}{5}$ o.e. (allow $s = 2.209\dots$ so awrt 2.21) Correct answer is 2 marks
(c)	Ignore comments about different number of runners. Don't need to state means are the same. If there is no answer given for (b) then no marks can be scored in (c)	
SC "2.2">3.6	B1	for coach <i>B</i> and states s.d. of <i>B</i> is greater o.e. Must compare. Allow implied choose <i>B</i> e.g. <i>B</i> has a greater range or <i>B</i> s values are more spread out or $3.6 > "2.2"$ or $\sigma_B > "2.2"$ May say s.d. of <i>A</i> is smaller which is equivalent to saying s.d. of <i>B</i> is larger
	dB1	(dep on 1 st B1 scored) for clear reason why greater s.d. means choose coach <i>B</i> Idea of greater range and more extreme values (faster times) in <i>B</i> e.g. <i>B</i> has more (or greater chance of or greater % of) runners at lower times (may compare mean – 1 or 2 or 3 standard deviations to show that <i>B</i> has the quicker time) e.g. coach <i>A</i> (52.9) > (51.5) coach <i>B</i> so coach <i>B</i> likely to be quickest
	NB	"coach <i>B</i> since <i>B</i> has greater range /s.d. and so more extreme values" scores B1B1
	(A0 in (b) and answer > 3.6)	
SC "2.2"<3.6	B1	equivalent reasons as above but choose <i>A</i>
	dB1	same rules as above but applied to <i>A</i>