Standardised Scores Mark Scheme

Q1.

Question	Answer	Additional guidance	Mark
(a)	M1 Adila: $\frac{60-75}{10}$ Brandon: $\frac{60-65}{4}$ A1A1 $=-1.5$ $=-1.25$	M1 for attempt at standardised scores for both (condone $\pm(x-\text{mean})/\text{sd}$ for M1) A1 for each correct answer. (Accept equivalents)	(3)
(b)	B2 Adila had the best journey due to the lower standardised score	B2 for a complete conclusion in context making reference to standardised score values. Accept converse about B. (Otherwise B1 for correct comparison of standardised scores without conclusion) If B0 scored allow B1 for 'both quicker than normal'	(2)
(c)	B1 e.g. the journeys have different distributions / means / standard deviations	B1 for recognising that values are from different distributions making standardised scores appropriate	(1)

Q2.

Question number	Answer	Additional guidance	Mark
(a)	B1 $\frac{62-59}{6}$ $(=0.5)$	B1 for correct calculation (may be seen in stages). Answer not required.	(1)
(b)	B1 should use standardised scores / $0.7 > 0.5$ / her standardised score for maths is higher than it is for statistics B1dep hence did better in Maths / Freya is not correct	1st B1 for explanation or comparison of standardised scores Do not accept reference to maths standardised score being closer to 1 2nd B1 dependent for correct conclusion	(2)
(c)	B1 (standardised score) would be negative	B1 for correct equivalent statement	(1)

Q3.

Question number	Answer	Additional guidance	Mark
(a)	M1A1A1 for calculating standardised scores M1 Long jump: $\frac{6.43-6.10}{0.26}$, High jump: $\frac{1.86-1.79}{0.066}$ A1 Long jump: 1.3 A1 High jump: 1.1 B2 for e.g. Better performance in long jump (relative to their competitors) as there is a higher standardised score in long jump OR (if B2 not scored) B1 for e.g. Better performance in long jump (relative to their competitors) with an attempt at a reason	M1 for either correct calculation A1 for awrt 1.3 A1 for awrt 1.1 B2 for a correct contextual interpretation of results with a correct reason using standardised scores OR (if B2 not scored) B1 for a correct contextual interpretation of results with an attempt at a reason	(5)
(b)	M1 $-0.32=\frac{42.51-x}{5.85}$ A1 $(x=)$ 44.382	M1 for demonstrating correct use of formula. A1 for awrt 44.38	(2)

Q4.

Question number	Answer	Additional guidance	Mark
(a)	M1 $\frac{68-55}{8}$ or $55+8\times1.5$ A1 1.625 or 67 depB1f.t. e.g. 'Mithra will get an interview'	M1 for standardising or for attempting to find minimum score required A1 for awrt 1.6 or 67 depB1ft reasoning statistically to form correct conclusion or correct ft conclusion (dep on M1 being scored)	(3)
(b)	B2 Alexi performed worse on the test since Alexi's (standardised) score was lower (o.e.)	B2 for Alexi performed worse since $-1.25<-1$ or with 45 and 47 seen (B1 for Alexi performed worse with **incomplete** reasoning e.g. since Alexi's score is further away from 0/mean')	(2)

Q5.

Question	Answer	Additional guidance	Mark
	M1 Test A: $\frac{16.3-14.4}{1.5}$, Test B: $\frac{21.6-19.8}{2.4}$ A1 Test A: 1.26(6…) A1 Test B: 0.75 B1 Better/faster performance in Test B, relative to the other students, with a reason B1 Lower standardised score in Test B, oe	M1 for either correct calculation A1 for 1.26-1.27 A1 for 0.75 B1 for contextual interpretation of results. B0 if no reason. B1 for statistical reasoning, using standardised scores, to support conclusion.	(5)

Q6.

	5ST1H_01 Scheme	Marks
(a)	Mean = 55	B1
	(85-'55')/3 or (85-25)/6	M1
	= 10	A1
		(3)
(b)	(Test 1) $\frac{60-'55'}{'10'}=0.5$ (Test 2) $\frac{60-64}{12}=-0.3333...$	M1A1ftA1
	Performed better on Test 1	B1
	... as standardised score is higher	dB1
		(5)
		[8]

	Notes	
(a)	B1 allow anything [53,57] M1 for finding half the range [27, 33] and using 3sd or finding the range [54, 66] and using 6sd A1 for [9,11]	
(b)	M1 $\frac{60-'55'}{'10'}$ or $\frac{60-64}{12}$ A1ft for Test 1 correct to 1dp or better using their values from (a) A1 for -0.3 or better 1st B1 performed better on Test 1 2nd B1 dependent on first B1 for Test 1 score is higher OR Test 1 score is positive **and** Test 2 score is negative OR Test 1 is above mean **and** Test 2 is below mean (condone average)	

Q7.

Question	Scheme	Marks
(a)	$\frac{14.1-14.5}{0.6}$ $= -0.66(6...)$	M1 A1 (2)
(b)	The gymnast did better on the balance beam, since the standardised score is higher.	B1ft B1ft (2)
(c)	$\frac{15.3-14.5}{0.6} = (1.333...)$ Normal distribution has 95% of data within ±2 standard deviations. Since no data is more than 1.3 standard deviations above the mean, it would <u>not</u> be <u>suitable</u> to use a normal distribution to model these data.	M1 M1 A1 (3) [7]

Notes	
(a)	M1 for using $\frac{\pm(X-\mu)}{\sigma}$ A1 for awrt –0.7 allow –2/3 or $-0.\dot{6}$ for A1
(b)	1st B1 for better on the balance beam 2nd B1 for standardised score on balance beam is higher or standardised score is positive for the balance beam and negative for the vault or scored above mean on balance beam and below mean on vault If their (a) > 0.5, then ft vault for both B1 marks.
(c)	1st M1 for calculating the standardised score for 15.3 or calculating $14.5 + 2 \times 0.6$ (=15.7) 2nd M1 for use of 95% within ±2 standard deviations of mean/virtually all data within ±3 standard deviations of mean 3rd A1 dependent upon both M marks for correct conclusion, it is <u>not suitable,</u> with correct figures.

Q8.

	Notes	
(a)	$\frac{63-53}{8}$ (=1.25)	B1 (1)
(b)	$\frac{78-69}{10}$ = 0.9 OR 1.25 ×10 + 69 = 81.5	M1 A1
	Kirstin did better in Maths (o.e.), with a correct reason e.g. 1.25 > 0.9 OR 'her (standardised) score was higher'	A1ft (3)
(c)	$\frac{x-48}{6} = -0.5$ o.e. (e.g. $x = 48 - 3$) = 45	M1 A1 (2) [6]

	Notes
(a)	Answer given on paper. Mark is for complete working with 63, 53 and 8 Allow e.g. 1.25 × 8 + 53 = 63 Working may be done in stages.
(b)	M1 for correct method for standardised score (may be in stages) 1st A1 for 0.9 OR 81.5 2nd A1 for 'better in Maths' (accept 'worse in Physics') WITH correct **comparison** (in words or figures). OR (if standardised score >1.25 through arithmetic slip) 2nd A1ft for 'better in Physics' (accept 'worse in Maths') WITH correct **comparison** (in words or figures). **NB**: 2nd A1 is NOT dependent upon 1st A1
(c)	Allow correct equivalent equation OR embedded answer for M1

Q9.

Question number	Answer	Additional guidance	Mark
(a)	B2 Floor was the best performance (relative to other competitors) as it has the highest standardised score AND Pommel/rings are worst performance (relative to other competitors) as they have lower standardised score OR if B2 not earned… B1 for an incomplete answer e.g. floor was the best performance (relative to other competitors) as it had the highest standardised score OR pommel was the worst performance (relative to other competitors) as it had the lowest standardised score OR performance in floor was better than performance (relative to other competitors) in pommel as the standardised score was higher OR performance in floor was better than in pommel and/or in rings	B2 for a complete conclusion in context making reference to standardised score values. Must compare performance between three pieces of apparatus. Accept reference to floor being a positive standardised score /above mean (condone average) and pommel/rings being a negative standardised score /below mean (condone average) OR if B2 not earned… B1 for an incomplete conclusion	(2)
(b)	B1 eg • the apparatus have different distributions / means / standard deviations • scores in one apparatus may tend to be higher than in another • difficulty may be different for each apparatus	B1 for recognising that values are from different distributions making standardised scores appropriate	(1)
(c)	M1 $\frac{x-14.389}{0.854} = 0.247$ A1 14.6	M1 for forming a correct equation to solve to find the score A1 for awrt 14.6	(2)