**1.** Barry recorded the times, in seconds, taken by some students to run a race.

The times taken by the students are normally distributed with mean 52.6 seconds and standard deviation 2.7 seconds.

Jenny’s time for the race is 49.2 seconds.

(*a*) Calculate Jenny’s standardised time.

Give your answer to 2 decimal places.

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**(2)**

Toby’s standardised time is –1.20.

(*b*) Who did better in the race, Jenny or Toby?

You must explain your answer.

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**(1)**

**(Total for Question 1 is 3 marks)**

**2.** Andrew entered a swimming race.

The times in this race are normally distributed with a mean time of 57 seconds and a
standard deviation of 8 seconds.

Andrew swam the race in a time of 70 seconds.

(*a*) Calculate the standardised score for Andrew.

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**(2)**

Ravina swam in the same race.

Her standardised score is 1.8.

(*b*) Which of Andrew or Ravina did better in the race?

 Give a reason for your answer.

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**(1)**

**(Total for Question 2 is 3 marks)**

**3.** The table gives the mean and the standard deviation of the marks in three examinations.

The marks in each of these examinations are normally distributed.

|  |  |  |
| --- | --- | --- |
|  | **Mean** | **Standard deviation** |
| **Art** | 70 | 5 |
| **Music** | 65 | 2.5 |
| **Drama** | 58 | 4 |

Lisa got a mark of 77 in the Art examination and a mark of 70 in the Music examination.

(*a*) Calculate Lisa’s standardised score in each of these two examinations.

Standardised Art score ..........................................

Standardised Music score ..........................................

**(3)**

(*b*) Did Lisa do better in the Art examination or in the Music examination?

 Give a reason for your answer.

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**(1)**

For the Drama examination, Lisa’s standardised score is –1.5.

(*c*) Calculate Lisa’s mark in the Drama examination.

..........................................

**(2)**

**(Total for Question 3 is 6 marks)**

**4.** The weights of the fish in a lake are normally distributed with mean 480 g and standard deviation 50 g.

Mary caught a fish from the lake.

The weight of the fish was 450 g.

(*a*) Calculate the standardised weight of Mary’s fish.

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**(2)**

Julie and Pam each caught a fish from the lake.

The standardised weight of Julie’s fish is –1.5.

The standardised weight of Pam’s fish is 0.65.

(*b*) Compare the weights of these two fish.

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**(1)**

**(Total for Question 4 is 3 marks)**

**5.** Ian wants to train as a translator.

He sits language tests to help him decide in which language he should specialise.

He sits a Spanish test, a Mandarin test and a Russian test.

The table gives the mean mark and the standard deviation of the marks for all the
candidates in each of the three tests.

|  |  |  |
| --- | --- | --- |
| **Test** | **Mean mark** | **Standard deviation** |
| **Spanish** | 65 | 2 |
| **Mandarin** | 72 | 5 |
| **Russian** | 79 | 4 |

Ian scored 68 marks in the Spanish test and 78 marks in the Mandarin test.

(*a*) Calculate the standardised score for the Spanish test and for the Mandarin test.

Standardised Spanish score..........................................

Standardised Mandarin score..........................................

**(3)**

In the Russian test, Ian had a standardised score of −1.5.

(*b*) Calculate Ian’s mark in the Russian test.

..........................................

**(2)**

**(Total for Question 5 is 5 marks)**

**6** The distances, in metres, some athletes threw a javelin were recorded.

The mean distance was 45.4 metres and the standard deviation was 3.6 metres.

Taylor threw the javelin 52 metres.

(*a*) Calculate Taylor’s standardised score.

 Give your answer correct to 2 decimal places.

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**(2)**

For the javelin, Daisy’s standardised score was 1.7.

(*b*) Who threw the javelin the further, Taylor or Daisy?

 Give a reason for your answer.

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**(1)**

**(Total for Question 6 is 3 marks)**