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|  | **68-95-99.7 Rule and z-scores** |
|  | The masses of all the breeds of dogs are assumed to follow a bell-shaped distribution with a mean of 40 kg and a standard deviation of 3 kg. (3 marks)  Write the expected masses between which approximately:   1. 68% of dogs lie 2. 95% of dogs lie 3. 99.7% of dogs lie. |
|  | In a Maths test, the mean score was 72 and the standard deviation was 6. Kyna scored 87 on the test. Calculate her mark as a *z*-score. (2 marks) |
|  | In a Science test, the mean score was 70.5 and the standard deviation was 8.5. Abdul scored 62 on the test. Calculate his mark as a *z*-score. (2 marks) |
| **4** | The blood pressure (systolic) among women of a certain age group is distributed normally with a mean of  (mm of mercury) and a standard deviation of  (mm of mercury). In a group of  women of this certain age, how many would you expect to have a systolic blood pressure of:  (4 marks)  (a) between  and  (b) less than  (c) greater than  (d) between  and . |

Answers

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|  | The masses of all the breeds of dogs are assumed to follow a bell-shaped distribution with a mean of 40 kg and a standard deviation of 3 kg.  Write the expected masses between which approximately:   1. 68% of dogs lie 2. 95% of dogs lie 3. 99.7% of dogs lie. | 1. 37 kg and 43 kg 2. 34 kg and 46 kg 3. 31 kg and 49 kg | 3 |
|  | In a Maths test, the mean score was 72 and the standard deviation was 6. Kyna scored 87 on the test. Calculate her mark as a *z*-score. |  | 2 |
|  | In a Science test, the mean score was 70.5 and the standard deviation was 8.5. Abdul scored 62 on the test. Calculate his mark as a *z*-score. |  | 2 |
| **4** | The blood pressure (systolic) among women of a certain age group is distributed normally with a mean of  (mm of mercury) and a standard deviation of  (mm of mercury). In a group of  women of this certain age, how many would you expect to have a systolic blood pressure of:  (a) between  and  (b) less than  (c) greater than  (d) between  and . | ,  \\BRI-FS02\archive2\Wiley_jacplus\MATHS QUEST 12 FM 5E VCE U3&4 EGD (O)\ART\ART-TECHNICAL\Topic Tests\JPG\C01\MQFM_1B.05.jpg  (a)  of values lie within  of  is .  Hence, we would expect  or  women to have blood pressure between  and .  (b) 130 is one standard deviation above the mean.  Less than a measure of  represents  84% of 150=126  Hence, we would expect 126 women to have blood pressure less than 130.  (c) 120 is the mean; hence, we would expect 50% of women to have blood pressure greater than 120. This amounts to 75 women.   1. 90 and 150 represents ; hence, we would expect 99.7% to fall within this range.   99.7% of 150=149.55  We would therefore expect 149 to 150 women to fall within this range. | 4 |