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| Math MCU | Worksheet – Exam Review 4 |

1. Which of the following correlation coefficients represents the strongest correlation?

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| --- | --- | --- | --- |
| A) | -0.8 | C) | 0.5 |
| B) | -0.3 | D) | 0.7 |

1. The coefficient of linear correlation between two variables is -1. Which of the following statements is true?

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| --- | --- |
| A) | There is no correlation. |
| B) | There is a very low correlation, with one variable increasing as the other increases. |
| C) | There is a very low correlation, with one variable decreasing as the other increases. |
| D) | There is a perfect correlation, with one variable decreasing as the other increases. |

1. A wheel is divided into four sections.

|  |  |
| --- | --- |
|  | The wheel is spun. What is the probability that when the wheel stops spinning, the pointer will be pointing to the yellow section?  **Answer:** |

1. The probability that the Montreal Canadiens will win the Stanley Cup is . What are the odds that the Montreal Canadiens will **not** win the Stanley Cup?
2. An amusement park features a game of dice. Players roll a fair die whose six faces are numbered 1 to 6. The rules of the game are as follows:

• Players who roll a number less than 4 will lose $3.

• Players who roll a 4 will neither win nor lose any money.

• Players who roll a number greater than 4 will win $3.

Fill in the box next to the statement that correctly describes this game.

**This game is fair. 🞏**

**This game favours the player. 🞏**

**This game is not fair to the player. 🞏**

1. The height, in centimetres, of a group of elementary-school children is represented below.



What is the percentile rank of a student who is 123 cm tall?

**Answer:**

1. The following data shows the number of sit ups completed in 30 seconds by a group of girls & a group of boys in a gym class.

**Girls: 15, 17, 20, 22, 25, 26**

**Boys: 14, 18, 21, 23, 26, 30**

Fill in the box next to the statement that correctly describes this situation.

**The data for the girls is more spread out than the data for the boys. 🞏**

**The data for the girls is distributed the same as the data for the boys. 🞏**

**The data for the girls is more concentrated than the data for the boys. 🞏**

1. A game involves betting $2 & drawing a marble from a bag of 10 ten marbles, of which 3 are red, 5 are blue and 2 are green. If participants draw:

* A red marble, they win $5
* A blue marble, they win nothing
* A green marble, they win $10

Bets are not returned.

Does this game favor the player?

1. A game of chance involves drawing one of 10 marbles from a bag. The marbles are numbered 1 to 10. Participants must place a bet of $6. The rules of the game are as follows:

* If participants draw marble number 1 or 2, they win $12
* If participants draw marble number 3, 4 or 5, they win a certain amount of money
* If participants draw any other marble, they lose the money they bet.

Bets are not returned.

The game is fair.

Sam decides to play the game and draws a marble from the bag. It is marble number 4. How much money will Sam win?

1. Michael is studying the linear correlation between the age and the diameter of the trunk of birch and maple trees found in a forest. The distributions represented by the following table of values and scatter plot show Michael's data.

|  |  |  |
| --- | --- | --- |
| **Distribution 1** | | **Distribution 2** |
| Birch trees | | Maple trees |
| Age  (years) | Diameter  of the trunk  (mm) |  |
| 2 | 10 |  |
| 16 | 25 |  |
| 12 | 20 |  |
| 10 | 30 |  |
| 6 | 25 |  |
| 6 | 5 |  |
| 10 | 15 |  |
| 8 | 10 |  |
| 17 | 35 |  |
| 16 | 45 |  |
| 4 | 5 |  |
| 14 | 20 |  |
| 12 | 40 |  |
| 8 | 30 |  |

Compare the coefficient of linear correlation between the variables of these two distributions by darkening the correct box.

|  |  |  |
| --- | --- | --- |
| The coefficient of linear correlation between the variables of Distribution 1 (Birch trees) is | **less than 🞏**  **equal to 🞏**  **is greater than 🞏** | The coefficient of linear correlation between the variables of Distribution 2 (Maple trees) |

1. You pay $5 to spin a wheel that is divided into four different-coloured & -sized sections.

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| --- | --- |
| Red 90o  Green  Blue 50o  Yellow 120o | * If the wheel lands on the red section, a certain amount of money is won. * If the wheel lands on the yellow section, nothing is won. * If the wheel lands on blue, $10 is won. * If the wheel lands on green, $5 is won.   The game is fair.  If a person lands on the red section, how much are they expected to win? |

1. Carrie is applying for a scholarship from the McGill Faculty of Science. Applicants will receive a scholarship provided they meet the following requirements:

* The applicant’s chemistry mark must be in at least the 80th percentile of their class
* The applicant’s physics mark must be in at least the 75th percentile of their class.
* In addition, both the applicant’s chemistry & physics marks must be at least 10 marks higher than the mean of the class.

The tables below show the marks for Carrie’s chemistry & physics classes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Chemistry Class** | **Mark** |  | **Physics Class** | **Mark** |
| Alice | 86 |  | **Carrie** | **89** |
| Ben | 94 |  | Lenny | 90 |
| **Carrie** | **93** |  | Martha | 85 |
| Dave | 78 |  | Nathan | 81 |
| Emma | 83 |  | Olive | 78 |
| Frank | 79 |  | Peter | 84 |
| Gail | 90 |  | Ruth | 79 |
| Hector | 84 |  | Sam | 57 |
| Isabel | 93 |  | Tara | 67 |
| Jack | 77 |  | Wayne | 94 |
| Karen | 69 |  | Virginia | 62 |

Will Carrie receive a scholarship?

1. The following are 18 out of 20 distribution values:

**10, 10, 11, 11, 11, 13, 14, 15, 15, 15, 15, 16, 16, 17, 17, 19, 20, 20**

One of the missing values occupies the 85th percentile & is unique in the distribution.

The other missing value is not unique in the distribution & occupies the 73rd percentile.

The average of all 20 of the values is equal to the distribution’s mode & median.

The distribution’s mean deviation is 2.5.

Find the two missing values.