1. 1 / 1 point

Set	Values			
1	1	5	7	9
2	−20	−10	0	10
3	100	101	102	103
4	−10	−5	0	−5

Consider the four sets of samples above. Which one has the smallest **variance?**

- ○ 1
- ○ 2
- ◉ 3
- ○ 4

Correct
The variance measures how much a sample is spread. We can easily look at all the samples and check that this one has the smallest spread.

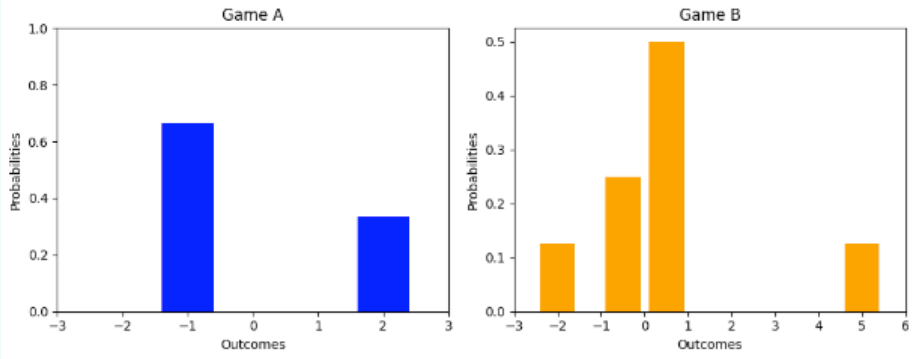
2. 1 / 1 point

Consider two games, Game A and Game B, each with different probability distributions of winnings and losses. Game A has a probability of $\frac{1}{3}$ to win \$2 and a probability of $\frac{2}{3}$ to lose \$1. Game B has a probability of $\frac{1}{2}$ to win \$0.50, a probability of $\frac{1}{4}$ to lose \$0.50, a probability of $\frac{1}{8}$ to win \$5, and a probability of $\frac{1}{8}$ to lose \$2.

Which of the following statements is **true**?

- ○ Game B's kurtosis is smaller than Game A's kurtosis.
- ◉ Game A's kurtosis is smaller than Game B's kurtosis.
- ○ Both Game A and Game B have the same kurtosis.

Correct
Kurtosis measures the shape and thickness of the rails of a probability distribution. A larger kurtosis indicates thicker tails and more extreme values. In this case, Game Y has a larger kurtosis because it has thicker tails due to the presence of extreme values (winning \$5 or losing \$2 with small probabilities).



3. Consider the following **independent** random variables: 1 / 1 point

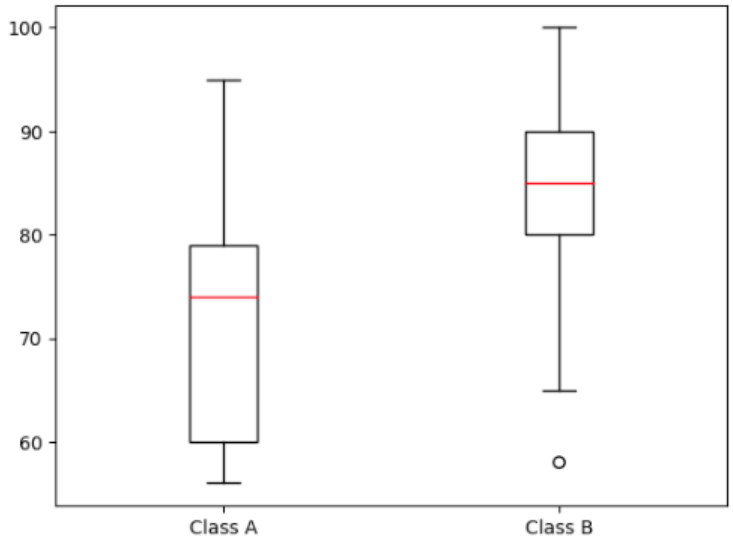
$$X \sim \text{Normal}(3, 1^2)$$
$$Y \sim \text{Normal}(2, 2^2)$$

Then $Z = X + Y \sim \text{Normal}(\mu, \sigma^2)$, where μ, σ are equal to:

- ○ $\mu = \sqrt{5}, \sigma = \sqrt{3}$
- ◉ $\mu = 5, \sigma = \sqrt{5}$
- ○ $\mu = 5, \sigma = \sqrt{3}$
- ○ $\mu = 5, \sigma = 5$

Correct
Using the formula $\mu_Z = \mu_X + \mu_Y$ and $\sigma_Z = \sqrt{\sigma_X^2 + \sigma_Y^2}$ you get the result!

4. Consider the following box plot for the test scores of two classes, A and B: 1 / 1 point



Which of the following statements is true?

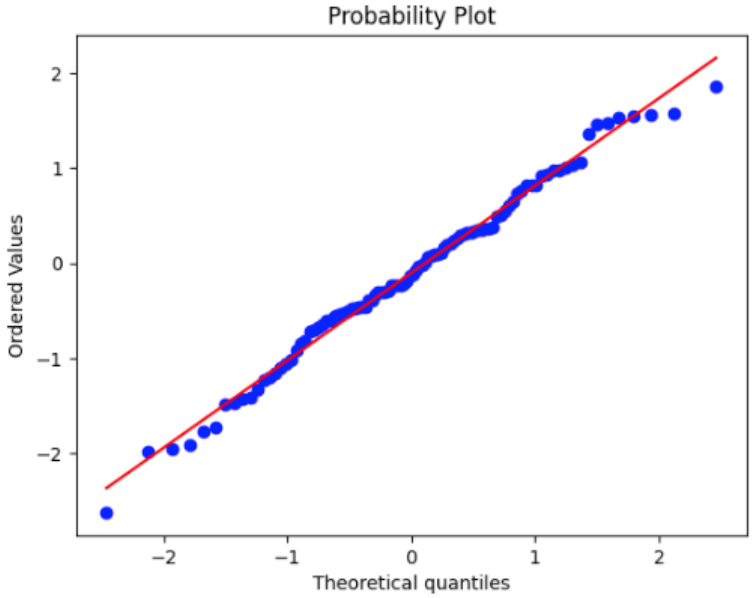
- [x] Class B's median score is higher than Class A's median score.

Correct
Looking at the box plot, we can see that the median of Class A is around 75, while the median of Class B is around 85.

- [ ] Class A's median score is higher than Class B's median score.
- [ ] Class B's interquartile range (IQR) is larger than Class A's interquartile range.
- [x] Class A's interquartile range (IQR) is larger than Class B's interquartile range.

Correct
The rectangle in A is bigger than B.

5. Consider the following QQ plot for a set of data: 1 / 1 point



Which of the following statements is true?

- (●) The data looks normally distributed.
- ( ) The data has a higher variance than a normal distribution.
- ( ) The data is not normally distributed.
- ( ) The data has a lower variance than a normal distribution.

Correct
The QQ plot compares the observed data with the theoretical quantiles of a normal distribution. If the points lie close to the diagonal line, then the data is likely normally distributed.