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# Practice quiz on Simplification Rules and Sigma Notation

GESAMTPUNKTZAHL 6

1. Suppose that  $A = \sum_{i=1}^3 i^2$  and  $B = \sum_{j=1}^3 j^2$ .

- ☒ 14
- ☐ 1
- ☐ 9



Richtig

We compute  $\sum_{i=1}^3 i^2 = 1^2 + 2^2 + 3^2 = 14$

2. Suppose that  $A = \sum_{k=1}^{100} k^4$  and  $B = \sum_{j=1}^{100} j^4$ .

1 / 1 Punkten

Which of the following statements is true?

- ☒  $A = B$
- ☐ There is not enough information to do the problem



Richtig

$A = B$ . Both summations evaluate to the same number, since  $k$  and  $j$  are just dummy indices.

3. Which of the numbers below is equal to the summation  $\sum_{i=1}^{10} 7$ ?

1 / 1 Punkten

- ☒ 70
- ☐ 7
- ☐ 55



Richtig

According to one of our Sigma notation simplification rules, this summation is just equal to 10 copies of the number 7 all added together, and so we get  $10 \times 7 = 70$ .

4. Suppose that  $X = \sum_{i=1}^5 i^3$  and  $Y = \sum_{i=1}^5 i^4$ .

1 / 1 Punkten

Which of the following expressions is equal to the summation  $\sum_{i=1}^5 (2i^3 + 5i^4)$ ?

- ☒  $2X + 5Y$
- ☐ 7
- ☐ 3375
- ☐  $X + Y$

To get here, you apply two of our Sigma notation simplification rules  $\sum_{i=1}^5 2i^3 = 2 \sum_{i=1}^5 i^3 = 2X$  and  $\sum_{i=1}^5 5i^4 = 5 \sum_{i=1}^5 i^4 = 5Y$ .

5. Which of the following numbers is the mean  $\mu_Z$  of the set  $Z = \{-2, 4, 7\}$ ?

1 / 1 Punkten

- ☐ 4
- ☐ 9
- ☒ 3
- ☐  $\begin{aligned} \frac{13}{3} \end{aligned}$



Richtig

To get the mean of a set of numbers, you need to perform two steps: first add them all up (in this

So you should obtain  $\mu_Z = \begin{aligned} \frac{9}{3} = 3 \end{aligned}$ , which you did!

6. Suppose the set  $X$  has five numbers in it:  $X = \{x_1, x_2, x_3, x_4, x_5\}$ . Which of the following expression represents the mean of the set  $X$ ?

1 / 1 Punkten

- ☐  $\begin{aligned} \frac{1}{N} \left[ \sum_{i=1}^N x_i \right] \end{aligned}$
- ☐  $\sum_{i=1}^5 x_i$
- ☒  $\begin{aligned} \frac{1}{5} \left[ \sum_{i=1}^5 x_i \right] \end{aligned}$
- ☐  $\begin{aligned} \frac{1}{5} \left[ \sum_{i=1}^5 (x_i - \mu_X)^2 \right] \end{aligned}$



Richtig

To obtain the mean of a set of numbers, you first add them all up (which is expressed here by the sigma operation inside the square brackets) and then you divide by the number of numbers