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## Practice quiz on Simplification Rules and Sigma Notation

PUNTOS TOTALES DE 6

1. Which of the numbers below is equal to the following summation:  $\sum_{i=1}^3 i^2$ ? 1 / 1 puntos

- ☐ 30  
☒ 14  
☐ 1  
☐ 9

✓ Correcto  
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 puntos

Which of the following statements is true?

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

✓ Correcto  
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 puntos

- ☒ 70  
☐ 7  
☐ 55  
☐ 0

✓ Correcto

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 puntos

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

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

✓ Correcto

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

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

1 / 1 puntos

- ☐ 9  
☒ 3  
☐ 4  
☐  $\frac{13}{3}$

✓ Correcto

To get the mean of a set of numbers, you need to perform two steps: first add them all up (in this case getting  $-2 + 4 + 7 = 9$ ), and then divide by the number of elements in the set (in this case that number is 3).

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 puntos

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

✓ Correcto

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 in the set (which is expressed here by the  $\frac{1}{5}$  outside the square brackets).