Practice quiz on Simplification Rules and Sigma Notation

TOTAL POINTS 6

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

`1 / 1 point`

- ○ 30
- ● 14
- ○ 1
- ○ 9

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

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

`1 / 1 point`

Which of the following statements is true?

- ● $A = B$
- ○ There is not enough information to do the problem
- ○ $B > A$
- ○ $A > B$

✓ **Correct**
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 point`

- ● 70
- ○ 7
- ○ 55
- ○ 0

✓ **Correct**
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 × 7 = 70

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

`1 / 1 point`

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

- ○ 3375
- ○ $X + Y$
- ○ 7
- ● $2X + 5Y$

✓ **Correct**
To get here, you apply two of our Sigma notation simplification rules

$$\sum_{i=1}^{5} 2i^3 + 5i^4 = 2\left(\sum_{i=1}^{5} i^3\right) + 5\left(\sum_{i=1}^{5} i^4\right) = 2X + 5Y .$$

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

`1 / 1 point`

- ● 3
- ○ 4
- ○ $\frac{13}{3}$
- ○ 9

✓ **Correct**
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).

So you should obtain $\mu_Z = \frac{y}{3} = 3$, 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 point`

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

✓ **Correct**