$$f(x_1, x_2, x_3) = x_1^2 - 2x_1x_2 + 5x_2x_3 + 2x_3^3$$

what is the gradient of f?

A. $2x_1 - 2x_1 + 5x_3 + 6x_3^2$

B. $[2x_1 - 2x_2, -2x_1 + 5x_3, 5x_2 + 6x_3^2]$ 

C. $[2x_1, -2x_1, 5x_2, 6x_3^2]$

D. $[2x_1, -2x_1 + 5x_3, 6x_3^2]$

$$E(w_0, w_1, ..., w_d) = \frac{1}{2}\sum_{i=1}^{N}(w_0 + w_1 x_{i1} + ... + w_d x_{id} - y_i)^2$$

What is $\frac{\partial E}{\partial w_k}$?

A. $\sum_{i=1}^{N}(w_0 + w_1 x_{i1} + ... + w_d x_{id} - y_i)x_{ik}$

B. $\sum_{i=1}^{N}(\mathbf{w}^{\mathbf{T}}\mathbf{x}_i - y_i)x_{ik}$

C. $\sum_{i=1}^{N}(\mathbf{w}^{\mathbf{T}}\mathbf{x}_i - y_i)^2 x_{ik}$

We have a six sided die. Let $p_1, p_2, \ldots p_6$ represent the probability of each side.
We roll the die n times and observe the number of each side as $n_1, n_2, \ldots n_6$ with $n_1+n_2+\ldots+n_6=n$.

What is the likelihood function?

A. $n_1 p_1 + n_2 p_2 + n_3 p_3 + n_4 p_4 + n_5 p_5 + n_6 p_6$

B. $n_1^{p_1} * n_2^{p_2} * n_3^{p_3} * n_4^{p_4} * n_5^{p_5} * n_6^{p_6}$

C. $p_1^{n_1} * p_2^{n_2} * p_3^{n_3} * p_4^{n_4} * p_5^{n_5} * p_6^{n_6}$ 

D. $p_1^{n_1} + p_2^{n_2} + p_3^{n_3} + p_4^{n_4} + p_5^{n_5} + p_6^{n_6}$

For a particular email x, our model estimates P(y=Spam|x) = 0.6, What is the expected loss for predicting spam and non-spam respectively?

A.Spam: 0.4; Non-spam: 0.6
B.Spam:4; Non-spam: 0.6
C.Spam: 4; Non-Spam: 6
D.Spam: 0.6; Non-spam: 4

True label→ Predicted ↓	Spam	Non-spam
Spam	0	10
Non-spam	1	0