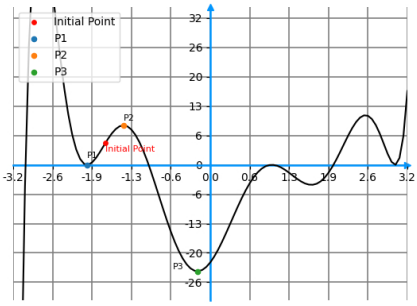
1. About the Gradient Descent method, choose all that are true: 1 point

- [ ] It always converges to a local minimum.
- [x] The result may vary depending on the initial point.
- [ ] If it converges, then it converges to a global minimum.
- [x] It only works for differentiable functions.

2. Given the Initial Point on the following graph, to which point will the Gradient Descent method converge? 1 point



- (•) P1.
- ( ) P2.
- ( ) P3.
- ( ) It won't converge.

3. Given that $f(x,y) = x^3y^2 + 3y^3$, find its derivative with respect to y, i.e., find $\frac{\partial f}{\partial y}$. 1 point

Note: Please use * to indicate the product in the answer. So, if we wrote the entire function f as an answer, it would be x^3 * y^2 + 3 * y^3.

$2x^3y + 9y^2$

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2*x^3*y+9*y^2
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4. Let $f(x,y) = 2x^2 + 3y^2 - 2xy - 10x$, the minimum value of $f(x,y)$ is 1 point

- (•) -15
- ( ) 3
- ( ) 1

5. What are the parameters that the Gradient Descent algorithm has? (check all that apply) 1 point

- [x] Initial point
- [ ] Final point
- [x] Learning rate
- [x] Number of iterations

6. Let $f(x,y) = x^2 + y^2 - 6x$ and $\nabla f(x,y) = \begin{bmatrix} 2x - 6 \\ 2y \end{bmatrix}$ and let the initial point $x_0 = (0,1)$. 1 point

Performing the gradient descent algorithm with learning rate = 0.1, the first iteration will lead us the point x_1 which is:

- (•) $x_1 = (0.6, 0.8)$
- ( ) $x_1 = (-6, 2)$
- ( ) $x_1 = (6, -1)$
- ( ) $x_1 = (0, 1)$