

QUIZEN – Vectors and Calculus (11P03)

Learning Level 1	Learning Level 2	Learning Level 3
Q - Remembering (knowledge-based questions) U - Understanding (comprehension-based questions)	I - Applying (application-based questions) Z - Analyzing (analysis-based questions)	E - Evaluating (evaluation-based questions) N - Creating (creation-based questions)

Learning Level 1

1. Write the formula for calculating the dot product of two vectors in terms of their components.
2. Calculate the dot product of the vectors $a = (3, -2, 5)$ and $b = (1, 4, -2)$.
3. Define the properties of the dot product of vectors.
4. State the geometric interpretation of the dot product of two vectors.
5. Determine whether the dot product of two vectors is commutative. Explain your answer.

Learning Level 2

6. Given the vectors $a = (2, -3, 1)$ and $b = (4, 1, -2)$, calculate their cross product.
7. Find the area of the parallelogram formed by the vectors $u = (3, -1, 2)$ and $v = (-2, 4, -3)$.
8. Prove that the cross product of two parallel vectors is zero. Use the vectors $u = (1, 2, -3)$ and $v = (2, 4, -6)$ as an example.
9. State the properties of the cross product of vectors.
10. Explain the geometric interpretation of the cross product of two vectors.

Learning Level 3

11. A vector $a = (2, 3, 1)$ is perpendicular to vector $b = (4, -2, 3)$. Determine the values of the constants x and y in the equation $a \times c = xa + yb$, where c is a vector.
12. Prove that the cross product of two vectors is perpendicular to both of the vectors. Use vectors $u = (1, -2, 3)$ and $v = (4, 5, -1)$ to demonstrate.
13. A force $F = (3, -2, 4)$ acts on a body, causing a displacement $d = (5, 1, -3)$. Calculate the work done by the force F on the body.
14. Determine whether the cross product of two vectors is associative. Provide an example to support your answer.
15. Create an example of a problem that involves both the dot product and the cross product of vectors. Solve the problem and explain each step.



Learning Level 2
Learning Level 3