M 408M Discussion Session
T.A.: Antonio Sodre
Vectors

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Vector

1. Given two points \( A(x_1, y_1, z_1) \) and \( B(x_2, y_2, z_2) \)
\[
AB = (x_2 - x_1, y_2 - y_1, z_2 - z_1).
\]

2. Dot Product (Inner Product)
\[
A \cdot B = x_1 x_2 + y_1 y_2 + z_1 z_2.
\]

3. Properties
\[
A \cdot A = ||A||^2.
\]
\[
A \cdot B = ||A|| ||B|| \cos \theta.
\]
1. Two vectors are perpendicular if and only if (denoted \( a \perp b \)) if and only if

\[ a \cdot b = 0 \]