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TRIGONOMETRY APPLICATIONS

TORQUE/DISPLACEMENT

CONCEPT In trigonometry, torque and displacement are related to the concept of circular motion. Torque is the measure of the force that causes an object to rotate around an axis or pivot point, while displacement is the distance and direction that an object has moved from its initial position.

BACKGROUND

The history of torque and displacement dates back to the ancient Greeks, who studied the principles of motion and mechanics. The Greek mathematician Archimedes was one of the first to study the principles of leverage and torque, which he used to design machines such as the pulley and the lever. The development of trigonometry in the Islamic Golden Age and the European Renaissance further advanced the understanding of circular motion and the relationship between force, angle, and displacement.

REAL WORLD CONNECTIONS

Wind turbines consist of a rotor blade that rotates around a central axis when wind blows on it, generating torque that is transferred to a generator to produce electricity.

In order to maximize the energy output of the wind turbine, the rotor blades need to be positioned in the most optimal direction to capture the maximum amount of wind energy. This requires the calculation of the angle of the rotor blade relative to the wind direction, which can be determined using trigonometric functions such as sine and cosine.

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