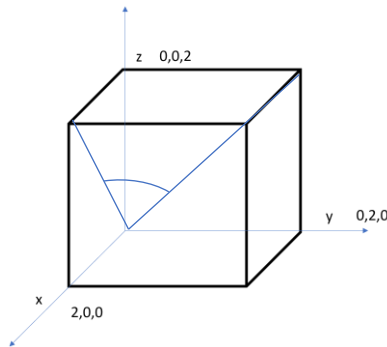# Tutorial 2: PHY101

(MONSOON 2024)

Q1 Find the angle between the face diagonals of the given cube

Q2 A man uses a boat to cross the river if the velocity of the boat is 20 km/h having an angle of 60° the direction of river flow and the resultant velocity by which boat crosses the river is 25 km/h then what is the velocity by which river is flowing?

Q3 Find the area of the triangle having vertices at P(1, 3, 2), Q(2, -1, 1), R(-1, 2, 3).

Q4 Two vectors A and B have equal magnitudes of 10 units. Vector A makes an angle of 30 degrees with the positive x-axis, while vector B makes an angle of 45 degrees with the positive y-axis. Calculate the dot product and cross product of vectors A and B.

Q5 Find the unit vector parallel to resultant vector of $r_1 = 2i + 4j - 5k$ and $r_2 = i + 2j + 3k$

Q6 Given vectors **A**, **B** and **C** construct (a) **A**-**B**+2**C** and (b) 3**C**- 1/2 (2**A**-**B**). (use scale and only parallelly shift the vectors and the resultants)