Dot product problems

1. a) Compute $\langle 1, 2, -4\rangle \cdot \langle 2, 3, 5\rangle$. $2 + 6 - 20 = -12$

b) Is the angle between these two vectors acute, obtuse or right? Obtuse as dot product is -ve.

2. Suppose $\mathbf{B} = \langle 2, 2, 1\rangle$. Suppose also that $\mathbf{B}$ makes an angle of 30° with $\mathbf{A}$ and $\mathbf{A} \cdot \mathbf{B} = 6$. Find $|A|$.

$A \cdot B = |A||B| \cdot \cos 30°$

$6 = |A| \, 3 \cdot \sqrt{3}/2$

$|A| = \frac{4}{\sqrt{3}}$

3. If $\mathbf{A} \cdot \mathbf{B} = 0$ what is the angle between $\mathbf{A}$ and $\mathbf{B}$?

$90°$ or $\pi/2$

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