"QUIZ" for Lecture 2

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E-MAIL ADDRESS SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com
(Attachment: q2FirstLast.pdf) ASAP BUT NO LATER THAN FRIDAY Sept. 11, 8:00pm

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1. Determine whether the two vectors are orthogonal and if not, whether the angle between them is acute or obtuse. * dot product = 0.

a. <1, 1, 1>, <3, −2, −1>

$a_x \times b_x + a_y \times b_y + a_z \times b_z = 0$!

$1 \cdot 3 + 1 \cdot -2 + 1 \cdot -1$

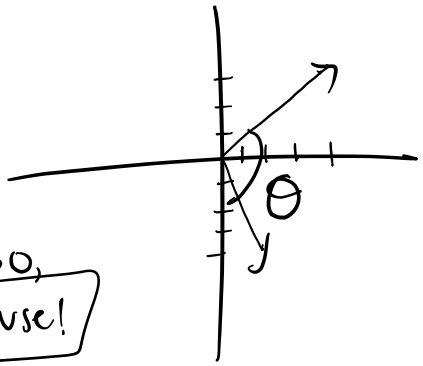
$3 + -2 - 1 = 3 - 3 =$ 0 ✓ perpendicular!

b.<4, 3>, <2, −4>

$a_x \times b_x + a_y \times b_y = 0$?

$4 \cdot 2 + 3 \cdot -4 =$

$8 + -12 = -9 \rightarrow$ not orthogonal



→ Since dot product of a·b is >0, we know the angle θ is obtuse!

a b

2. Calculate **v** × **w**, if **v** = <0, 1, −1>, **w** = <1, −1, 0>
x y z x y z

$C_x = a_y b_z - a_z b_y = 0 \cdot 0 - -1 \cdot -1 = 0 - 2 = -2$

$C_y = a_z b_x - a_x b_z = -1 \cdot 1 - 0 \cdot 0 = -1 - 0 = -1$

$C_z = a_x b_y - a_y b_x = 0 \cdot -1 - 1 \cdot 1 = -1 - 1 = -2$

→ cross product is $\langle -2, -1, -2 \rangle$