Big Question - Do in Grid Book

You are given points A(-2, 2, 2) and B(2, 3, -1)

a) Sketch vector $\overrightarrow{OB}$.

b) Determine the length of $\overrightarrow{OA}$ and $\overrightarrow{OB}$.

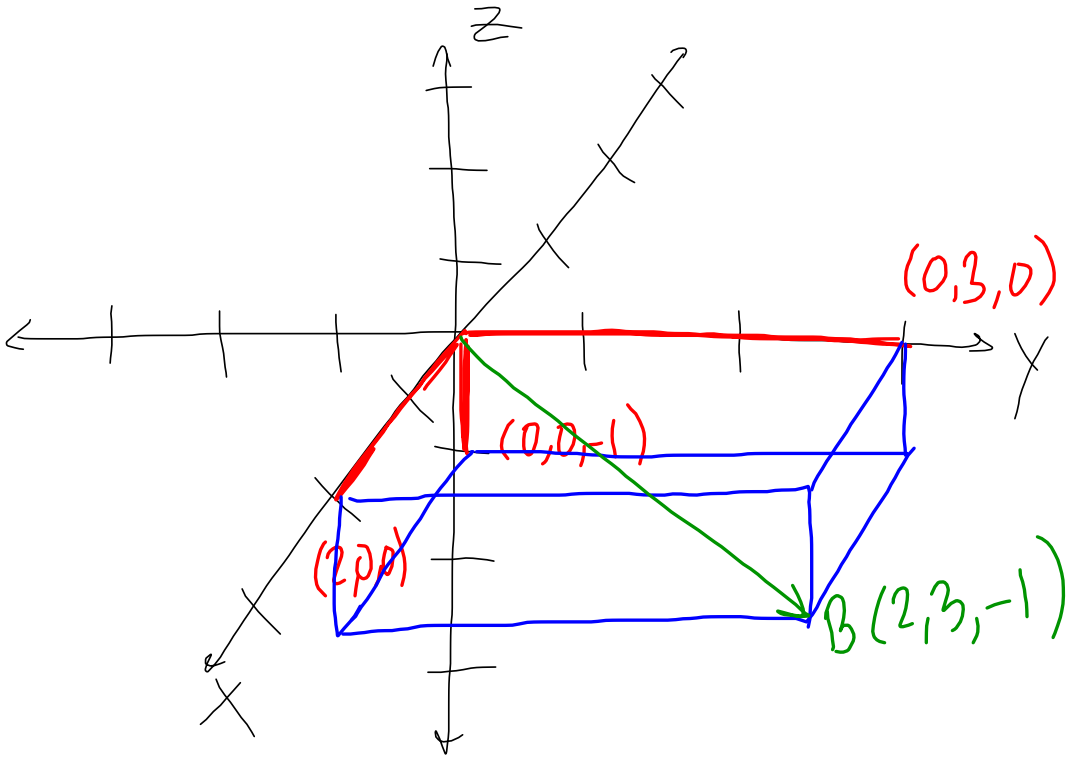
c) Write $\overrightarrow{OA}$ + $\overrightarrow{OB}$ in unit vector form.

d) Determine the length of $\overrightarrow{OA}$ - $\overrightarrow{OB}$.

e) Write vector $\overrightarrow{AB}$ in component form.

f) Determine the length of $\overrightarrow{AB}$.

a) $\vec{OB} = (2, 3, -1)$



b) $|\vec{OA}| = \sqrt{(-2)^2+(2)^2+(2)^2}$

$= \sqrt{12}$ ☺

$= 2\sqrt{3}$ ☺

c) $\overrightarrow{OA} + \overrightarrow{OB}$

$= (-2,2,2) + (2,3,-1)$

$= (-2+2, 2+3, 2-1)$

$= (0,5,1)$

$= 0\vec{i} + 5\vec{j} + 1\vec{k}$

$= 5\vec{j} + \vec{k}$

OR

$(-2\vec{i} + 2\vec{j} + 2\vec{k}) + (2\vec{i} + 3\vec{j} - \vec{k})$

$= -2\vec{i} + 2\vec{i} + 2\vec{j} + 3\vec{j} + 2\vec{k} - \vec{k}$

$= 5\vec{j} + \vec{k}$

d) $\vec{OA} - \vec{OB} = (-2, 2, 2) - (2, 3, -1)$

$= (-2-2, 2-3, 2+1)$

$= (-4, -1, 3)$

$|\vec{OA} - \vec{OB}| = \sqrt{(-4)^2 + (-1)^2 + (3)^2}$

$= \sqrt{16+1+9}$

$= \sqrt{26}$

e) $\overrightarrow{AB} = \overrightarrow{OB} - \overrightarrow{OA}$

$= (2,3,-1) - (-2,2,2)$

$= (4,1,-3)$

f) $|\vec{AB}|$

$\vec{AB} = (4, 1, -3)$

$|\vec{AB}| = \sqrt{(4)^2 + (1)^2 + (-3)^2}$

$= \sqrt{16 + 1 + 9}$

$= \sqrt{26}$

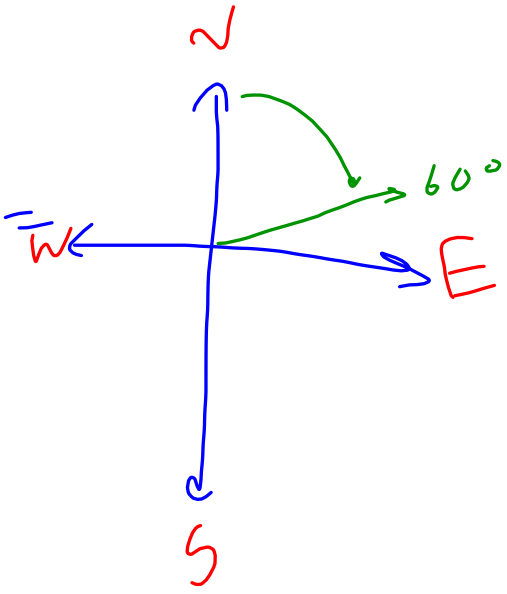
$|\vec{AB}| = \sqrt{(2-(-2))^2 + (3-2)^2 + (-1-2)^2}$

$= \sqrt{(4)^2 + (1)^2 + (-3)^2}$

$= \sqrt{26}$

What wasn't covered in the "Big Question?"

- NSEW
- 060°



= N60°E
= E30°N

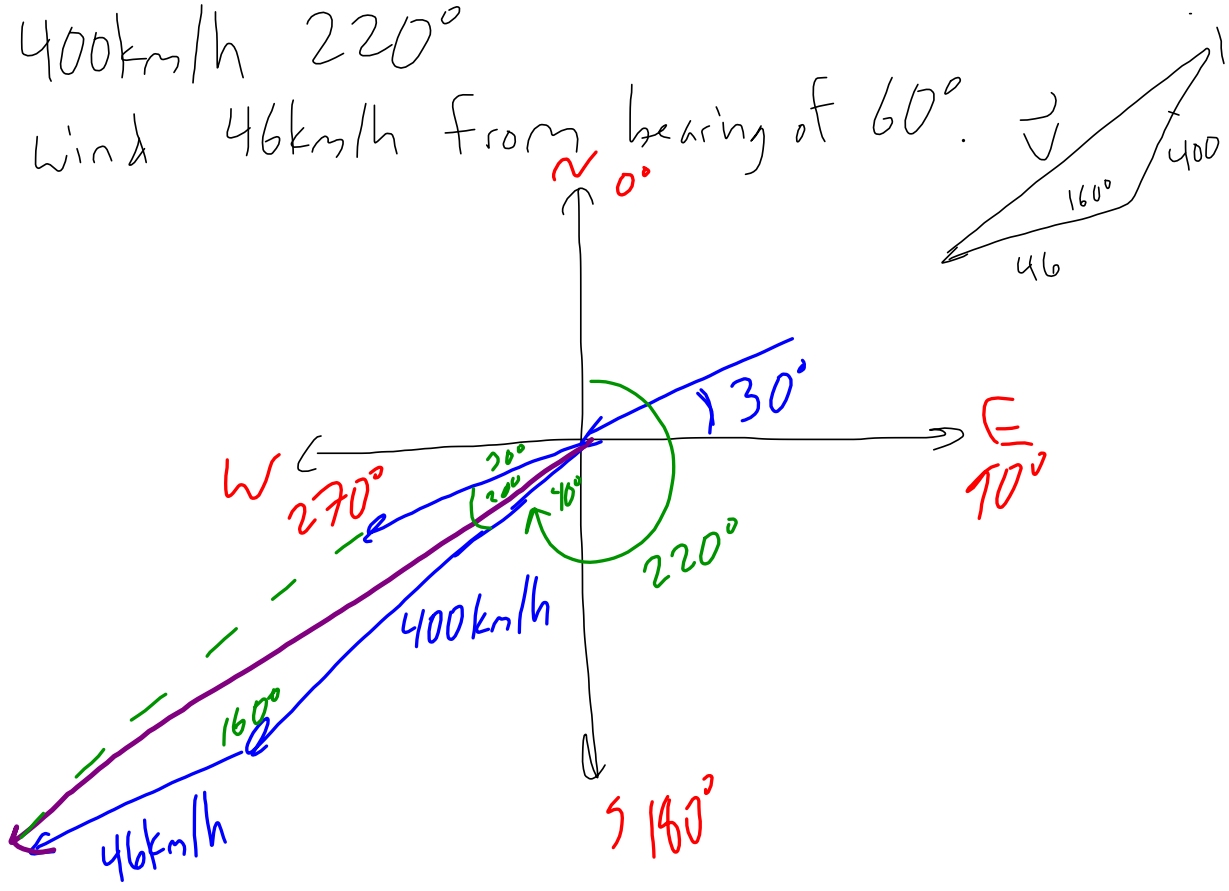
- Using Sine Law + Cosine Law

$$\frac{x}{\sin X} = \frac{y}{\sin Y} = \frac{z}{\sin Z}$$

$$c^2 = a^2 + b^2 - 2ab\cdot\cos C$$

Plane flying 200km/h due West with a 60km/h wind from the south.

400km/h 220°
wind 46km/h from bearing of 60°.



$$v^2 = 46^2 + 400^2 - 2(46)(400)\cos 160°$$