ESCUELA POLITECNICA NACIONAL
DEPARTAMENTO DE FORMACIÓN BASICA
FISICA

TAREA #

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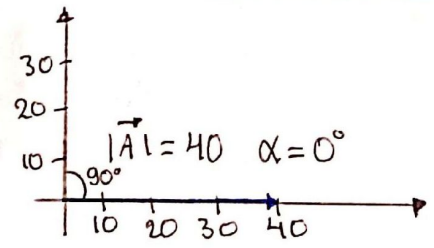
TEMA: Vectores

1. **Calcular: modulo, vector unitario, modulo del vector unitario, ángulos directores y gráfica de los siguientes vectores.**

1) $\vec{A} = 40\,\vec{i}$

Módulo	$\lvert\vec{A}\rvert = \sqrt{(40\vec{i})^2 + (0\vec{j})^2 + (0\vec{k})^2}$ $\lvert\vec{A}\rvert = 40$
Vector Unitario	$\vec{U}_A = \frac{40\vec{i}}{40}$ $\vec{U}_A = 1\,\vec{i}$
Módulo del vector unitario	$\lvert\vec{U}_A\rvert = \sqrt{1^2}$ $\lvert\vec{U}_A\rvert = 1$
Ángulos directores	$\cos\alpha = \frac{A_x}{A}$ $\beta = \cos^{-1}\left(\frac{A_y}{A}\right)$ $\gamma = \cos^{-1}\left(\frac{A_z}{A}\right)$ $\alpha = \cos^{-1}\left(\frac{40i}{40}\right)$ $\beta = \cos^{-1}\left(\frac{0}{40}\right)$ $\gamma = \cos^{-1}\left(\frac{0}{40}\right)$ $\alpha = 0°$ $\beta = 90°$ $\gamma = 90°$
Gráfica	

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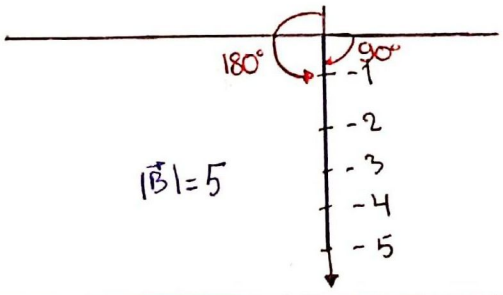
2) $\vec{B} = -5\vec{j}$

Módulo	$\lvert\vec{B}\rvert = \sqrt{(-5\vec{j})^2}$ $\lvert\vec{B}\rvert = 5\vec{j}$
Vector Unitario	$\vec{U}_A = \frac{-5\vec{j}}{5}$ $\vec{U}_A = -1\vec{j}$
Módulo del vector unitario	$\lvert\vec{U}_A\rvert = \sqrt{(-1\vec{j})^2}$ $\lvert\vec{U}_A\rvert = 1$
Ángulos directores	$\cos\alpha = \frac{Ax}{A}$ $\beta = \cos^{-1}\frac{Ay}{A}$ $\gamma = \cos^{-1}\frac{Az}{A}$ $\alpha = \cos^{-1}\left(\frac{0}{5}\right)$ $\beta = \cos^{-1}\left(\frac{-5}{5}\right)$ $\gamma = \cos^{-1}\frac{0}{5}$ $\alpha = 90°$ $\beta = 180$ $\gamma = 90°$
Gráfica	

3) $\vec{C} = 14\vec{i} + 42\vec{j}$

Módulo	$\lvert\vec{C}\rvert = \sqrt{(14\vec{i})^2 + (42\vec{j})^2}$ $\lvert\vec{C}\rvert = 44,27$
Vector Unitario	$\vec{U}_C = \frac{14\vec{i}}{44,27} + \frac{42\vec{j}}{44,27}$ $\vec{U}_C = 0,32\vec{i} + 0,95\vec{j}$

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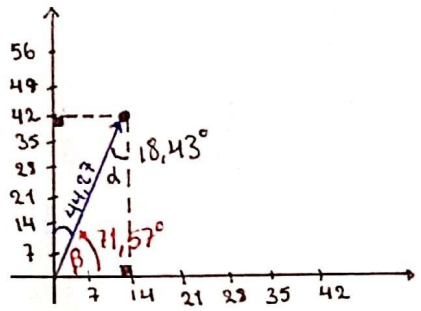
Módulo del vector unitario	$\lvert\vec{U}_c\rvert = \sqrt{(0{,}32\vec{i})^2 + (0{,}95\vec{j})^2}$ $\lvert\vec{U}_c\rvert = 1$
Ángulos directores	$\text{Sen}\,\beta = \frac{42}{44{,}27}$ $\quad \cos\alpha = \frac{42}{44{,}27}$ $\quad r = \cos^{-1}\frac{Az}{A}$ $\beta = \text{sen}^{-1}\left(\frac{42}{44{,}27}\right)$ $\quad \alpha = \cos^{-1}(42/44{,}27)$ $\quad r = \cos^{-1}\frac{0}{44{,}27}$ $\beta = 71{,}57°$ $\quad \alpha = 18{,}43$ $\quad r = 90$
Gráfica	

4) $\vec{D} = 120\vec{i} - 80\vec{j}$

Módulo	$\lvert\vec{D}\rvert = \sqrt{(120\vec{i})^2 + (-80\vec{j})^2}$ $\lvert\vec{D}\rvert = 144{,}22$
Vector Unitario	$\vec{U}_D = \frac{120\vec{i}}{144{,}22} + \frac{(-80\vec{j})}{144{,}22}$ $\vec{U}_D = 0{,}83\vec{i} - 0{,}55\vec{j}$
Módulo del vector unitario	$\lvert\vec{U}_D\rvert = \sqrt{(0{,}83\vec{i})^2 + (0{,}55\vec{j})^2}$ $\lvert\vec{U}_D\rvert = 1$
Ángulos directores	$\beta = \cos^{-1}\left(\frac{-80}{144{,}22}\right)$ $\beta = 123{,}69$ $\theta = \tan^{-1}\frac{80}{120}$ $\quad 56{,}31 + 3{,}69 + 90 = 180$ $\theta = 33{,}69$

$r = \cos^{-1}\left(\frac{0}{144{,}22}\right)$

$r = 90°$

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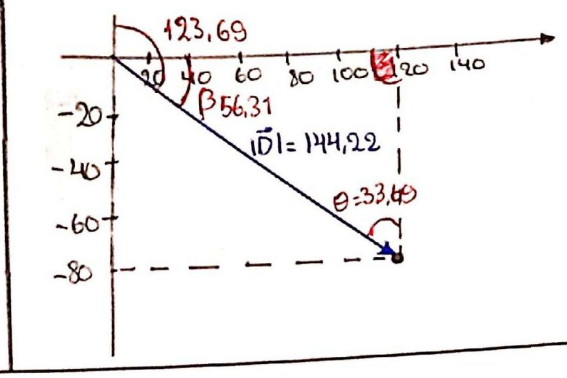
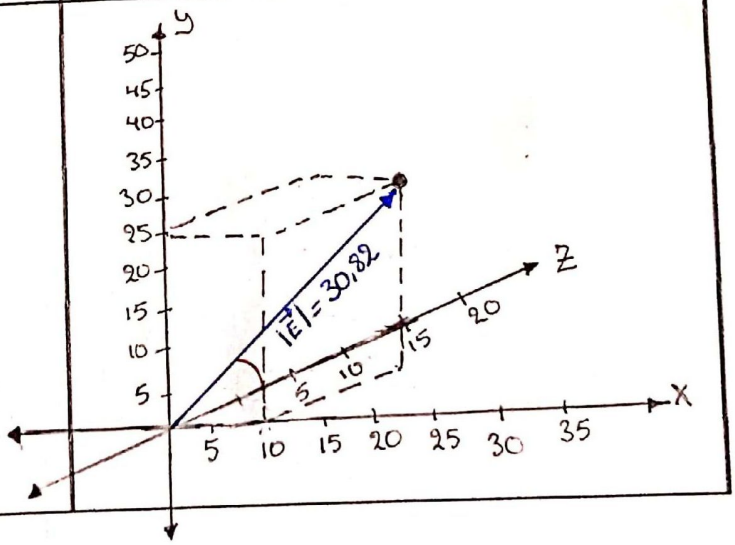
Gráfica	

5) $\vec{E} = 10\vec{i} + 25\vec{j} - 15\vec{k}$

Módulo	$\lvert\vec{E}\rvert = \sqrt{(10\vec{i})^2 + (25\vec{j})^2 + (15\vec{k})^2}$ $\lvert\vec{E}\rvert = 30,82$
Vector Unitario	$\vec{v}_E = \frac{10\vec{i}}{30,82} + \frac{25\vec{j}}{30,82} + \frac{(-15\vec{k})}{30,82}$ $\vec{v}_E = 0,32\vec{i} + 0,81\vec{j} - 0,49\vec{k}$
Módulo del vector unitario	$\lvert\vec{v}_E\rvert = \sqrt{(0,32\vec{i})^2 + (0,81\vec{j})^2 + (-0,49\vec{k})^2}$ $\lvert\vec{v}_E\rvert = 1$
Ángulos directores $\cos\alpha = \frac{10\vec{i}}{30,82}$ $\alpha = \cos^{-1}\frac{10}{30,82}$ $\alpha = 71,07$ $\beta = \cos^{-1}\frac{25}{30,82}$ $\beta = 35,79$	

$r = \cos^{-1}\left(\frac{-5}{33,79}\right)$

$r = 98,51$

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