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Assignment 1.1 Vector Algebra

E=(1,-1) F=(1,1) G=(2,3)
V=(1,-1,0) W=(1,1,1) Z=(0,1,2)
a=0.5, b=2, c=1.62

$X_1 = a*E + b*F - c*G$
$(0.5\cdot1, 0.5(-1)) + (2\cdot1, 2\cdot1) + (1.62\cdot2, 1.62\cdot3)$
$(0.5, -0.5) + (2, 2) + (3.24, 4.86)$
$(2.5, 1.5) + (3.24, 4.86)$
$X_1 = (5.74, 6.36)$

$X_2 = E/|E| + F/|F|$
$\frac{(1,-1)}{\sqrt{1^2+(-1)^2}} + \frac{(1,1)}{\sqrt{1^2+1^2}}$
$= \frac{(1,-1)}{\sqrt{2}} + \frac{(1,1)}{\sqrt{2}}$
$= \left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right) + \left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$
$= \left(\frac{2}{\sqrt{2}}, 0\right)$ $\frac{\sqrt{2}\cdot\sqrt{2}}{\sqrt{2}}$
$X_2 = (\sqrt{2}, 0)$

$X_3 = W/|W| - Z/|Z|$
$\frac{(1,1,1)}{\sqrt{1^2+1^2+1^2}} - \frac{(0,1,2)}{\sqrt{0^2+1^2+2^2}}$
$= \frac{(1,1,1)}{\sqrt{3}} - \frac{(0,1,2)}{\sqrt{5}}$
$= \left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right) - \left(0, \frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}\right)$
$= \left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}} - \frac{1}{\sqrt{5}}, \frac{1}{\sqrt{3}} - \frac{2}{\sqrt{5}}\right)$
$X_3 = \left(\frac{1}{\sqrt{3}}, \frac{\sqrt{5}-\sqrt{3}}{\sqrt{15}}, \frac{\sqrt{5}-2\sqrt{3}}{\sqrt{15}}\right)$

$X_4 = a*V - b*W + c*Z$
$= (0.5\cdot1, 0.5(-1), 0.5\cdot0) - (2\cdot1, 2\cdot1, 2\cdot1)$
$+ (1.62\cdot0, 1.62\cdot1, 1.62\cdot2)$
$= (0.5, -0.5, 0) - (2, 2, 2) + (0, 1.62, 3.24)$
$= (-1.5, -2.5, -2) + (0, 1.62, 3.24)$
$X_4 = (-1.5, -0.88, 1.24)$

$X_5 = ?$
$D = G + X_5$ $\theta = 45°$
$D = (2,3) + X_5$

$\tan(90) = \frac{v}{h}$
$1 = \frac{v}{h}$
$(h, v) = (2,3) + X_5$

$X_5 = (h-2, v-3)$ $h = v = x$
$X_5 = (x-2, x-3)$

$D = (1,1)$ $x=1$
$X_5 = (-1, -2)$
$X_5 = (0, -1)$
$D = (2,2)$ $x=2$
donde D es un vector de componentes iguales positivas