36. Calcula k para que la distancia entre las rectas $5x+12y-k=0$ y $5x+12y+15=0$ sea 2.

$$\left.\begin{array}{l} r: 5x+12y-k=0 \\ s: 5x+12y+15=0 \end{array}\right\} \quad ¿k? \,/\, d(r,s)=2$$

$$d(r,s)=\frac{|C-C'|}{\sqrt{A^2+B^2}} \quad (\text{pues } \vec{n}_r=\vec{n}_s)$$

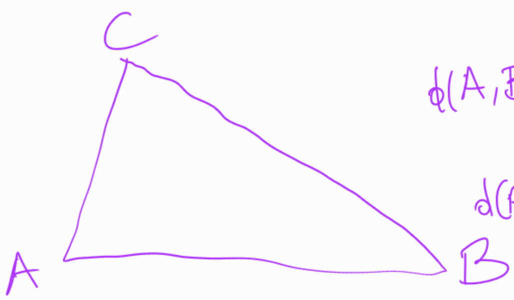
$$2=\frac{|15-(-k)|}{\sqrt{5^2+12^2}} \Rightarrow 2=\frac{|15+k|}{\sqrt{169}} \Rightarrow 2=\frac{|15+k|}{13}$$

$$2\cdot 13=|15+k| \Rightarrow 26=|15+k| \Rightarrow \left\{\begin{array}{ll} 15+k=26 & (1) \\ 15+k=-26 & (2) \end{array}\right.$$

$$15+k=26 \Rightarrow k=26-15 \Rightarrow \boxed{k=11}$$
$$15+k=-26 \Rightarrow k=-26-15 \Rightarrow \boxed{k=-41}$$

37. Comprueba si los siguientes triángulos son equiláteros, isósceles o escalenos:

a) $A(-2,1)$, $B(0,3)$ y $C(3,7)$

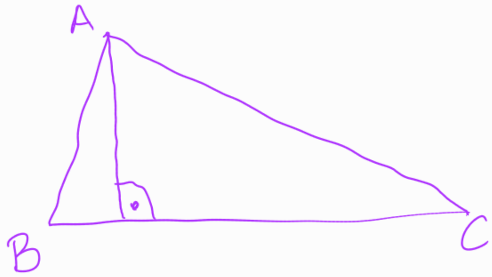


$$d(A,B)=|\vec{AB}|=|(0,3)-(-2,1)|=|(2,2)|$$
$$d(A,C)=|\vec{AC}|=|(3,7)-(-2,1)|=|(5,6)|$$
$$d(B,C)=|\vec{BC}|=|(3,7)-(0,3)|=|(3,4)|$$

$$\left.\begin{array}{l} |\vec{AB}|=\sqrt{2^2+2^2}=\sqrt{8}=2\sqrt{2}\,u \\ |\vec{AC}|=\sqrt{5^2+6^2}=\sqrt{61}\,u \end{array}\right\} \overset{\triangle}{ABC} \text{ NO ES EQUILÁTERO}$$

$$|\vec{BC}|=\sqrt{3^2+4^2}=\sqrt{25}=5\,u \Rightarrow \boxed{\overset{\triangle}{ABC} \text{ es ESCALENO}}$$

39. Calcula la medida de las alturas del triángulo de vértices $A(4, 1)$, $B(-1, 3)$ y $C(0, 4)$.



¿h_A?

$h_A = d(A, r_{BC})$

$h_B = d(B, r_{AC})$

$h_C = d(C, r_{AB})$

$$h_A \begin{cases} A(4,1) \\ r_{BC} \begin{cases} B(-1,3) \\ \vec{v}_{r_{BC}} = \vec{BC} = (0,4) - (-1,3) = (1,1) \Rightarrow \vec{n}_{r_{BC}} = (1,-1) \end{cases} \end{cases}$$

$$r_{BC}: 1(x+1) - 1(y-3) = 0$$

$$x + 1 - y + 3 = 0$$

$$\underline{r_{BC} \quad x - y + 4 = 0}$$

$$\boxed{h_A = d(A, r_{BC}) = \frac{|4-1+4|}{\sqrt{1^2+(-1)^2}} = \frac{|7|}{\sqrt{2}} = \frac{7}{\sqrt{2}} = \frac{7\sqrt{2}}{2}\ u}$$