Will Legg

Quiz 1

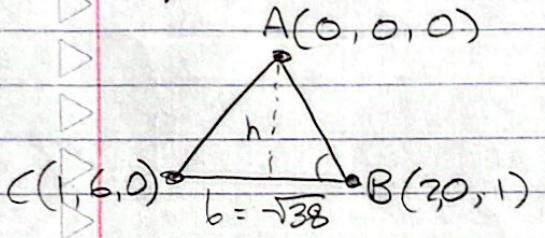
1] find radius: $x^2 + (y-2)^2 + z^2 + 2z = 3$

$= x^2 + (y-2)^2 + z^2 + 2z + 1 = 3 + 1$

$= x^2 + (y-2)^2 + (z+1)^2 = \boxed{4}$ → radius

$= \sqrt{4} = 2$

2] if $A = (0,0,0)$, $B = (2,0,1)$ $C = (1,6,0)$ **find area of** ΔABC $A = \frac{1}{2}bh$



$b = \overline{BC} = |BC| = \sqrt{(1-2)^2 + (6-0)^2 + (0-1)^2}$

$= \sqrt{38}$

$\angle B = \frac{BA \cdot BC}{|BA| \cdot |BC|} = \frac{\langle -2,0,-1 \rangle \cdot \langle -1,0,0 \rangle}{\sqrt{5} \cdot \sqrt{38}}$

$\angle B = \cos^{-1}\left(-\frac{2}{\sqrt{190}}\right)$

$\sin(1.7164) = \frac{h}{\sqrt{5}}$ $\quad h = 2.2124$

$A = \frac{1}{2}(\sqrt{38})(2.2124) \boxed{= 6.819}$

3] $u = \langle a, 4, 3 \rangle$, $v = \langle 1, 2, -5 \rangle$

$\text{Comp}_v u = \frac{v \cdot u}{|u|} = \frac{\langle a,4,3 \rangle \cdot \langle 1,2,-5 \rangle}{\sqrt{(a)^2 + (4)^2 + (3)^2}}$

$= \frac{1a + 8 + (-15)}{\sqrt{a^2 + 16 + 9}} = \boxed{\frac{a-7}{\sqrt{a^2+25}}}$