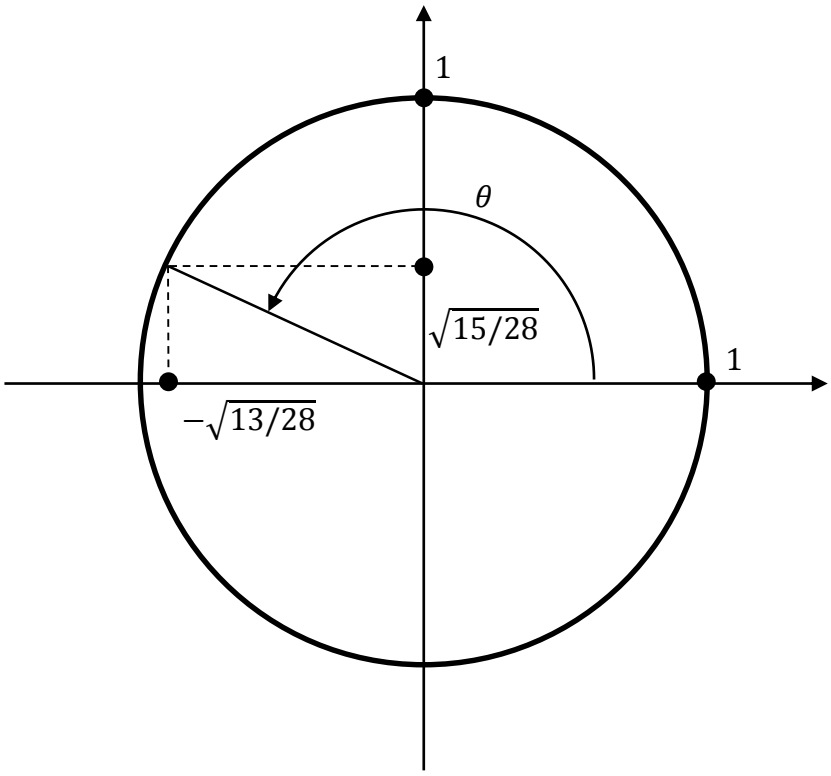
Answer on Question #51716 - Math - Vector Calculus

$\boldsymbol{a} = 2\boldsymbol{i} - 3\boldsymbol{j} - \boldsymbol{k}$, $\boldsymbol{b} = \boldsymbol{i} + 4\boldsymbol{j} + 3\boldsymbol{k}$ then what is their angle? if i use dot product formula it comes arc cos[(-sqrt(13)/{(2*sqrt(7)}] and if i use cross product formula then arc sin[(sqrt(15/28)] . two angles are not same if i convert to degree , then 1st one comes 132.951978120924 and the 2nd one 47.048021879076. It becomes equal that time if (180-47.048021879076) . because sin(180-x)=sin x . but for inverse function , we use the least value. like arc sin(1/2)= 30 degree, not 150 degree. so if i think at this angle the angle can't be equal. so which one is correct?

Solution:



The figure represents the unit circle. Abscissa (x-coordinate) represents the cosine of the angle theta, and the ordinate (y-coordinate) represents the sine of the angle theta. Given

$\cos\theta = -\frac{\sqrt{13}}{2\sqrt{7}}$, $\sin\theta = \frac{\sqrt{15}}{2\sqrt{7}}$, the correct answer is $\theta = 132.951978120924°$, since $\sin\theta > 0$ and $\cos\theta < 0$ (the angle θ should be greater than 90^{0}, but less than 180^{0} for these values of sine and cosine).

Answer: $132.951978120924°$.