Clicker Questions

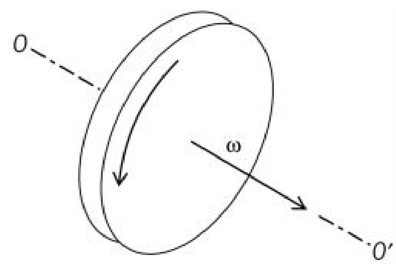
1. To prove that a planar space curve has 0 torsion, we

   a) First used two derivatives of the dot product equation of the plane in order to show that the (constant) normal to the plane (that the curve lies in) is always parallel to the binormal $B(s)$ (from the Frenet Frame of the curve) for all $s$.

   b) Then used a derivative of the (now shown to be) constant $B$ to show $0 = B'$ so $\tau = 0$.

   c) both of the above

   d) none of the above




angular velocity shown as an axial $B$ vector when $\tau = 0$

2. Combining the $T'$ Frenet equation with the expression for $T'$ in the Darboux vector $\omega$ (angular velocity vector), and writing it in terms of the basis given by $T, N$ and $B$, we can obtain:

$$\kappa N = T' = \omega \times T = (c_1 T + c_2 N + c_3 B) \times T$$

   Continue computing using the right-hand side.
   Then compare to the left side:

   a) $c_1 = 0$

   b) $c_2 = 0$

   c) $c_3 = 0$

   d) more than one of the above

   e) none of the above

3. The parametrization of the outer helix on the strake from the homework is

   a) $(\cos t, \sin t, \frac{10t}{2\pi})$

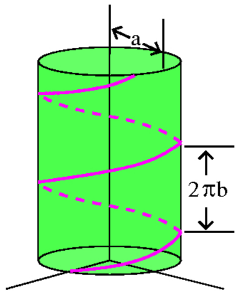
   b) $(1.2\cos t, 1.2\sin t, \frac{10t}{2\pi})$

   c) $(\frac{\pi^2+25}{\pi^2}\cos t, \frac{\pi^2+25}{\pi^2}\sin t, 0)$

   d) $((.2 + \frac{\pi^2+25}{\pi^2})\cos t, (.2 + \frac{\pi^2+25}{\pi^2})\sin t, 0)$

   e) $(\cos t, \sin t, 0)$

4. For each $s$, what is the angle between $T(s)$ on this circular helix and the vector $< 0, 0, 1 >$ translated to $\alpha(s)$?



a) the angle changes

b) the angle is constant

c) no way to tell