$\lim_{t\to 0^+} \tan(t) = \tan(0) = 0,\ \lim_{t\to 0^+} \cos(t) = \cos(0) = 1\ ,$

$\lim_{t\to 0^+} t^3 \ln(t) = \lim_{t\to 0^+} \dfrac{\ln(t)}{1/t^3} = \lim_{t\to 0^+} \dfrac{1/t}{-3/t^4} = \lim_{t\to 0^+} -t^3/3 = 0$ [by l'Hospital's Rule].

Thus $\lim_{t\to 0^+} \langle \tan(t), \cos(t), t^3 \ln(t)\rangle = \left\langle \lim_{t\to 0^+} \tan(t), \lim_{t\to 0^+} \cos(t), \lim_{t\to 0^+} t^3 \ln(t) \right\rangle$
$= \langle 0, 1, 0\rangle.$