ii) $\lim_{x \to 0} |x| \cos\left(\frac{3}{x}\right)$

since $\left|\cos\left(\frac{3}{x}\right)\right| \leq 1$, $|x|\left|\cos\left(\frac{3}{x}\right)\right| \leq |x|$

as $x \to 0$ we can choose $\varepsilon > 0$ such that $|x|\left|\cos\left(\frac{3}{x}\right)\right| < \varepsilon$

so $-\varepsilon < |x|\cos\left(\frac{3}{x}\right) < \varepsilon$

$\frac{2\frac{1}{2}}{5}$

We can make ε arbitrarily small, hence $\lim_{x \to 0} |x|\cos\left(\frac{3}{x}\right) = 0$

You haven't really completed this. Try the Squeeze Rule using.
$0 \leq \left| |x|\cos\left(\frac{3}{x}\right)\right| \leq |x|$

b) $\lim_{x \to 0} \frac{\sin x}{x} = 1$

$\lim_{x \to 0} \frac{\tan x}{x} = \lim_{x \to 0} \left(\frac{1}{\cos x} \times \frac{\sin x}{x}\right)$

$= \lim_{x \to 0} \left(\frac{1}{\cos x}\right) \times \lim_{x \to 0} \left(\frac{\sin x}{x}\right)$

$= \frac{1}{\cos 0} \times 1 = 1 \times 1 = 1.$

$5/5$

$\frac{12\frac{1}{2}}{15}$