1a) $\lim_{x\to 1} \cos\frac{\pi x}{3}$

$= \cos\frac{\pi}{3} = \frac{1}{2}$

1b) $\lim_{x\to 0} \sec 2x$

1c) $\lim_{x\to 3} \tan\left(\frac{\pi x}{4}\right)$

1d) $\lim_{x\to 2} \cot\left(\frac{3\pi}{2}x\right)$

2a) $\lim_{x\to 0} \frac{\sin x}{5x}$

$= \lim_{x\to 0}\left[\left(\frac{\sin x}{x}\right)\left(\frac{1}{5}\right)\right]$

$= (1)\left(\frac{1}{5}\right) = \frac{1}{5}$

2b) $\lim_{x\to 0} \frac{\sin x(1-\cos x)}{x^2}$

2c) $\lim_{x\to 0} \frac{\sin^2 x}{x}$

2d) $\lim_{x\to 0} \frac{2x}{3\sin 3x}$

2e) $\lim_{x\to \pi/2} \frac{\cos x}{\cot x}$

2f) $\lim_{h\to 0} \frac{(1-\cos h)^2}{h}$

2g) $\lim_{t\to 0} \frac{\sin 3t}{2t}$

2g) $\lim_{x\to \pi/4} \frac{1-\tan x}{\sin x - \cos x}$