(f) $\lim_{x\to 0^+} (1-kx)^{\frac{1}{x}}$ is a "1^∞" indeterminate form. As an exponent is involved, we should start by computing the limit of the natural logarithm of the given expression.

Let $y = (1-kx)^{\frac{1}{x}}$. $\therefore \ln(y) = \frac{1}{x}\ln(1-kx)$.

$\therefore \lim_{x\to 0^+} \ln(y) = \lim_{x\to 0^+} \frac{\ln(1-kx)}{x}$. This is an $\frac{0}{0}$ indeterminate form, so we use L'Hopital's rule to evaluate it.

$$= \lim_{x\to 0^+} \frac{\left(\frac{1}{1-kx}\right)(-k)}{1} = \lim_{x\to 0^+} \frac{-k}{1-kx} = -k.$$

$\therefore \lim_{x\to 0^+} \ln(y) = -k.$

$\therefore \lim_{x\to 0^+} (1-kx)^{\frac{1}{x}} = \lim_{x\to 0^+} e^{\ln y} = e^{\lim_{x\to 0^+} \ln y}$

because the exponential function is continuous

$= e^{-k}$.

2. C has parametric equations $x = 2\sin\left(\frac{\pi t}{2}\right)$, $y = 3\cos\left(\frac{\pi t}{2}\right)$, for $0 \le t \le 2$.

(a)

t	x	y	t	x	y	t	x	y
0	0	3	$2/3$	$\sqrt{3}$	$3/2$	$3/2$	$\sqrt{2}$	$-3/\sqrt{2}$
$1/3$	1	$\frac{3\sqrt{3}}{2}$	1	2	0	$5/3$	1	$-3\sqrt{3}/2$
$1/2$	$\sqrt{2}$	$\frac{3}{\sqrt{2}}$	$4/3$	$\sqrt{3}$	$-\frac{3}{2}$	2	0	-3