Question number	Scheme	Marks
5	$A=\pi(3r)^2=9\pi r^2 \Rightarrow \dfrac{\mathrm{d}A}{\mathrm{d}r}=18\pi r$	M1
	$\delta A \approx \dfrac{\mathrm{d}A}{\mathrm{d}r}\times\delta r = 18\pi r(\delta r)$	B1
	$\dfrac{\delta A}{A}\approx\dfrac{18\pi r}{A}\delta r=\dfrac{18\pi r}{9\pi r^2}\delta r=2\dfrac{\delta r}{r}$	M1
	So when $\dfrac{\delta r}{r}=0.05\% \Rightarrow \dfrac{\delta A}{A}\approx 0.1\%$ so the area increases by about 0.1%	M1A1
	ALT	
	Radius (after increase) = $3r\times\left(1+\dfrac{0.05}{100}\right)$	{M1}
	$= 3.0015r$	{B1}
	Area before increase = $\pi(3r)^2=9\pi r^2$ Area after increase =	
	$A=\pi(3.0015r)^2=9.00900225\pi r^2$	{M1}
	Percentage increase = $\dfrac{9.00900225\pi r^2-9\pi r^2}{9\pi r^2}\times 100 = 0.100025\approx 0.1\%$ so the area increases by about 0.1%	{M1} {A1}
		Total 5 marks

M1	Differentiate A wrt r
B1	Use of $\delta A \approx \dfrac{\mathrm{d}A}{\mathrm{d}r}\times\delta r$
M1	Use of $\dfrac{\delta A}{A}$
M1	Use of $\dfrac{\delta r}{r}=0.05\%$
A1	Area increases by about 0.1%
ALT:	
M1	Finding the radius after the increase (may be implied by $3.0015r$)
B1	$3.0015r$ (may be implied by a correct area after the increase)
M1	Finding the area after the increase
M1	Use of $\dfrac{\text{Area (new)-Area (original)}}{\text{Area (original)}}\times 100$
A1	Area increases by about 0.1%