Question Number	Scheme	Marks
6 (a)	When $x=\frac{3}{2}$ $y=3-\frac{9}{4}=\frac{3}{4}$ and $2y-\frac{3}{2}=0$	M1
	So $\left(\frac{3}{2},\frac{3}{4}\right)$ lies on both the line and the curve	A1cso (2)
(b)	$(\pi)\int_0^{\frac{3}{2}}(2x-x^2)^2\mathrm{d}x$	M1
	$=(\pi)\int_0^{\frac{3}{2}}(4x^2+x^4-4x^3)\mathrm{d}x$	A1
	$=(\pi)\left[\frac{4x^3}{3}+\frac{x^5}{5}-x^4\right]_0^{\frac{3}{2}}$	dM1
	$=\frac{153(\pi)}{160}$	A1
	$\frac{153\pi}{160}-\frac{1}{3}\pi\left(\frac{3}{4}\right)^2\left(\frac{3}{2}\right)=\frac{27\pi}{40}$	ddM1A1cao (6)
		[8]
ALT:	$\pi\int_0^{\frac{3}{2}}\left((2x-x^2)^2-\left(\frac{1}{2}x\right)^2\right)\mathrm{d}x$	M1
	$\pi\int_0^{\frac{3}{2}}(\frac{15}{4}x^2-4x^3+x^4)\,\mathrm{d}x$	A1
	$\pi\left[\frac{5x^3}{4}-x^4+\frac{x^5}{5}\right]_0^{\frac{3}{2}}$	dM1A1
	$\pi\left[\frac{135}{32}-\frac{81}{16}+\frac{243}{160}\right]=\frac{27\pi}{40}$	ddM1A1cao

(a)	
M1	Attempt to show that $\left(\frac{3}{2},\frac{3}{4}\right)$ lies on the curve and the line. Any valid method including solving the equations allowed.
A1cso	Appropriate conclusion following correct work. Verification, as shown, needs a conclusion.
	Solving the equations to obtain $\frac{x}{2}=2x-x^2$ or $y=4y-4y^2$ and hence coordinates of A needs no conclusion. M1 for reaching coords, A1 for correct coords (decimals allowed)

Question Number	Scheme	Marks
(b)	**Algebraic integration must be seen – otherwise no marks.** The first 4 marks can be awarded with or without π provided the work is consistent. The first 3 marks can be awarded if no limits are shown.	
M1	Correct integral, with or without π. Limits may be missing – ignore any shown.	
A1	Square the bracket correctly.	
dM1	Attempt the integration of their integrand. The power of at least one term should increase and no power should decrease. Ignore limits.	
A1	Substitute the correct limits and obtain $\frac{153}{160}$ or $\frac{153\pi}{160}$ (0.95625(pi))	
ddM1	Subtract the volume of the cone from their previous answer. Both terms to include π	
A1cao	Correct final answer (0.675pi)	
ALT:	**See above for general instructions re integration**	
M1	Integral must be the difference of 2 squared terms	
A1	Correct integrand after squaring, need not be simplified	
dM1	Attempt the integration of their integrand. The power of at least one term should increase and no power should decrease.	
A1	Correct result	
ddM1	Substitute their limits	
A1cao	Correct final answer.	