Question	Scheme	Marks	AOs
1(a) (i) (a) (ii)	$\{arg(z_1) =\} tan^{-1}\left(\frac{-3}{3}\right)$ or $\{arg(z_1) =\} tan^{-1}(-1)$ or $\{arg(z_1) =\} - tan^{-1}\left(\frac{3}{3}\right)$ or $\{arg(z_1) =\} -\frac{\pi}{4}$ or $\{arg(z_1) =\} 2\pi - \frac{\pi}{4} = \frac{7\pi}{4}$ or states should be – 3 not 3 on top	B1	2.3
	States that $\left\{arg\left(\frac{z_1}{z_2}\right) =\right\} arg(z_1) - arg(z_2)$ Or states that the arguments should be subtracted	B1	2.3
		(2)	
(b)	$\left\{arg\left(\frac{z_1}{z_2}\right) = \left(\text{their} -\frac{\pi}{4}\right) - \frac{\pi}{6} =\right\} -\frac{5\pi}{12}$ Or $\left\{arg\left(\frac{z_1}{z_2}\right) = \left(\text{their}\frac{7\pi}{4}\right) - \frac{\pi}{6}\right\} = \frac{19\pi}{12}$	B1ft	2.2a
		(1)	
			(3 marks)

Notes:

(a) (i)

B1: See scheme, Condone – 45

Any incorrect arguments seen is B0.

$arg(z_1) = tan^{-1}\left(\frac{3}{-3}\right)$ is B0

Note: They used 3 instead of – 3 is B0, there are two 3's in line 1 do they mean both should – 3

It should be negative is B0

(a) (ii)

B1: See scheme

(b)

B1ft: States a correct value for $arg\left(\frac{z_1}{z_2}\right)$ Follow through on their answer to part (a) (i), do not ISW