Express in $r(\cos\theta + i\sin\theta)$

$\underline{\underline{cis\theta}}$.

(i) $1 + i\tan\alpha$

(ii) $1 - \cos\alpha + i\sin\alpha$

(i) $1 + i\tan\alpha$

Compare with $r(\cos\theta + i\sin\theta)$

$r\cos\theta = 1$ — (1)

$r\sin\theta = \tan\alpha$ — (2)

Squering and adding ① & ②

$$r^2(\cos^2\theta + \sin^2\theta) = 1 + \tan^2\alpha$$

$$r^2 = \sec^2\alpha$$

$$\underline{\underline{r = \sec\alpha}}$$

$$\cos\theta = \frac{1}{\sec\alpha} = \cos\alpha$$

$$\sin\theta = \frac{\tan\alpha}{\sec\alpha} = \frac{\sin\alpha}{\cos\alpha}\cdot\cos\alpha = \sin\alpha$$

$$\sin\theta = \sin\alpha$$
$$\cos\theta = \cos\alpha$$

$$\Rightarrow \quad \theta = \alpha.$$

$$1 + i\tan\alpha = \sec\alpha(\cos\alpha + i\sin\alpha)$$