

2.88
25

$$\sin^6 x + \cos^6 x = \frac{11}{27} \quad \text{J3}$$

$$\cos x - \sin x = \frac{1}{3} \quad \text{J21}$$

$$(\cos x - \sin x)^2 = \frac{1}{9}$$

$$\cos^2 x - 2\sin x \cos x + \sin^2 x = \frac{1}{9}$$

$$1 - \sin 2x = \frac{1}{9}$$

$$\boxed{\sin 2x = \frac{8}{9}}$$

$$\sin^6 x + \cos^6 x = (\sin^2 x)^3 + (\cos^2 x)^3 = (\sin^2 x + \cos^2 x)(\sin^4 x - \sin^2 x \cos^2 x + \cos^4 x)$$

$$= 1[(\sin^2 x + \cos^2 x)^2 - 2\sin^2 x \cos^2 x - \sin^2 x \cos^2 x] =$$

$$= 1[1 - 3\sin^2 x \cos^2 x] = 1 - \frac{3}{4} \sin^2 2x = 1 - \frac{3}{4} \left(\frac{8}{9}\right)^2 = 1 - \frac{3}{4} \cdot \frac{64}{81} =$$

$$= 1 - \frac{16}{27} = \frac{11}{27}$$