

1. 0

2. $\frac{2}{3}(2\sqrt{2} - 1)$

3. $\frac{3\pi}{2}$

4. $2\pi(2\sin 2 + \cos 2 - 1)$

5. $\frac{32}{15}$

6. $\frac{\pi - 16}{3}$

7. 2π

8. $\frac{27}{2}$

9. $\frac{144\pi}{3}$

10. $\frac{32\pi}{3}$

11. $\frac{512\pi}{7}$

12. $\frac{\pi}{4}$

13. Use the identity for $|t| < 1$: $\frac{1}{1-t} = \sum_{n=0}^{\infty} t^n$, then integrate term by term.