1. (a) Use any graphing software to sketch the graph.
   (b) $t = \dfrac{\pi}{2}$
   (c) $t \in \left(\frac{\pi}{2}, \pi\right)$

2. (a) Use any graphing software to sketch the graph.
   (b) $y = -\sqrt{3}x + 8$

3. $A = \dfrac{3\pi}{2}$

4. (a) The sequence is convergent.
   (b) The sequence is convergent.

5. (a) The series is divergent.
   (b) The rational number is $\overline{0.123} = \dfrac{123}{999}$.

6. (a) The series is convergent.
   (b) The series is divergent.

7. (a) The series is absolutely convergent.
   (b) The series is divergent.

8. The series is conditionally convergent.

9. The radius of convergence is $R = 1$. The interval of convergence is $I = (2, 4]$.

10. The first four terms of the Taylor series is

$$e^3 \left(1 + (x - 3) + \frac{1}{2}(x - 3)^2 + \frac{1}{6}(x - 3)^3\right).$$

11. (a) The Taylor series is given by

$$\int \cos(x^2) \, dx = C + \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} \frac{x^{4n+1}}{4n + 1}$$

   (b) The Taylor series is given by

$$e^{-x^2} + \cos(x) = \sum_{n=0}^{\infty} (-1)^n \left(\frac{1}{n!} + \frac{1}{(2n)!}\right) x^{2n}$$