

## **Solutions:**

1. Find the critical numbers of the function.

a) None

b)  $x = -2$

c)  $\theta = n\pi, n \in \mathbb{Z}$

2. Find the absolute max/absolute min values of  $f$  on the given interval.

a) Absolute maximum:  $(\sqrt{2}, 2)$

b) Absolute minimum:  $(\sqrt{-1}, -\sqrt{3})$

3. Prove that the function  $f(x) = x^{101} + x^{51} + x + 1$  has neither a local maximum nor a local minimum.

4. Show that 5 is a critical number of the function  $g(x) = 2 + (x - 5)^3$  but  $g$  does not have a local extreme value at 5.