

Question 2

$$g(x) = x^4 - 3x^2 - 3 = 0 \quad \text{on } [1, 2] \quad p_0 = 1$$

$$g'(x) = 3^{1/4} \frac{1}{4} \frac{6x}{(x^2+1)^{1/4}}$$

$$g(1) = 1, g(2) = 1$$

$$g(x) = (3x^2 + 3)^{1/4}$$

$$p_1 = (3p_0 + 3)^{1/4} = 1.56508458$$

$$p_2 = (3p_1 + 3)^{1/4} = 1.793572879$$

$$p_3 = (3p_2 + 3)^{1/4} = 1.885943743$$

$$p_4 = (3p_3 + 3)^{1/4} = 1.922847844$$

$$p_5 = (3p_4 + 3)^{1/4} = 1.93750754$$

$$p_6 = (3p_5 + 3)^{1/4} = 1.94331693 \quad \leftarrow \text{CEVAP}$$

$$g'(x) = 3^{1/4} \frac{1}{4} \frac{6x}{(x^2+1)^{1/4}}$$

$$|p_1 - p| \leq \frac{k^n}{1 - k} |p_1 - p_0| < 10^{-2}$$

$$k = 0.486$$

$$n < \frac{-2}{0.82467696 \log(0.486)}$$

$$n < 7.7739$$

$$n = 7$$