$$f(x) = -0.9x^2 + 1.7x + 2.5$$

$$x_0 = 5, \quad x_r = x_0, \quad E_s = 0.01\%$$

a) $f(x) = 0 \rightarrow 1.7x + 2.5 = 0.9x^2$

$$x = \sqrt{\frac{1.7x + 2.5}{0.9}} = g(x)$$

$$x_1 = g(x_0) = 3.4960294 94$$

$$E_a = \frac{|x_1 - x_0|}{x_0} \cdot 100\% = 30.08\%$$

$$x_2 = g(x_1) = 3.062905327$$

$$E_a = \frac{|x_2 - x_1|}{x_1} \cdot 100\% = 14.14\%$$

$$x_3 = g(x_2) = 2.926305797$$

$$E_a = \frac{|x_3 - x_2|}{x_2} \cdot 100\% = 4.46\%$$

$$x_4 = g(x_3) = 2.881882073$$

$$E_a = \frac{|x_4 - x_3|}{x_3} \cdot 100\% = 0.02\%$$

$$x_5 = g(x_4) = 2.867286662$$

$$E_a = \frac{|x_5 - x_4|}{x_4} \cdot 100\% = 0.005\%$$

$$x_r = x_5 = 2.867286662$$

$$f(x_r) = -0.9(x_r)^2 + 1.7x_r + 2.5$$
$$= -2 \times 10^{-2}$$

6) $f'(x) = -1.8x + 1.7, \quad x_0 = 5$

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 3.424652524$$

$$\varepsilon_a = \frac{|x_1 - x_0|}{x_0} \cdot 100\% = 31.51 \ \%$$

$$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)} = 2.924356992$$

$$\varepsilon_a = \frac{|x_2 - x_1|}{x_1} \cdot 100\% = 14.61 \ \%$$

$$x_3 = x_2 - \frac{f(x_2)}{f'(x_2)} = 2.861146926$$

$$\varepsilon_a = \frac{|x_3 - x_2|}{x_2} \cdot 100\% = 2.16\%$$

$$x_4 = x_3 - \frac{f(x_3)}{f'(x_3)} = 2.860104689$$

$$\varepsilon_a = \frac{|x_4 - x_3|}{x_3} \cdot 100\% = 0.04\%$$

$$x_5 = x_4 - \frac{f(x_4)}{f'(x_4)} = 2.860104406$$

$$\varepsilon_a = \frac{|x_5 - x_4|}{x_4} \cdot 100\% = 2.2 \times 10^{-5}$$

$$x_r = x_5$$

$$f(x_r) = 1.69 \times 10^{-9}$$