

Name: \_\_\_\_\_ ID #: \_\_\_\_\_ Section: 10

**Q.1 (3.5 pts)** Find the linear approximation of the function  $f(x) = \sqrt{2-x}$  at  $a = 1$  and use it to approximate the numbers  $\sqrt{0.98}$  and  $\sqrt{1.04}$

\_\_\_\_\_

---

**Q.2 (2.5 pts)** Find the derivative of the given function.

a.  $f(x) = \sinh^2 x + \tanh(x^2)$

b.  $y = t \coth(e^{2\pi}) + \operatorname{sech}(e^t)$

\_\_\_\_\_

**Q.3 (4 pts)** Find the absolute maximum and absolute minimum values of  $f(x) = x^3 + 3x^2 - 9x + 4$  on the interval  $[-1, 2]$

\_\_\_\_\_