Math 132 Fall 2017
Group Quiz 6 10/18/17 Name (Print): ______________________

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1. Approximate $\sqrt{170}$

$f(x) = \sqrt{x}$. $f(169) = 13$

$f'(x) = \frac{1}{2\sqrt{x}}$. $f'(169) = \frac{1}{26}$

$L_a(x) = f'(a)(x-a) + f(a)$

$L_{169}(170) = f'(169)(170-169) + f(169) = 13 + \frac{1}{26}$.

2. Approximate $f(x) = \sin(x + \cos(x))$ at $x = 170°$.

$f'(x) = \cos(x + \cos(x))(1 + (-\sin x))$

$f'(\pi) = \cos(\pi - 1)$

$f(\pi) = \sin(\pi - 1)$

$L_\pi(x) = f(\pi) + f'(\pi)\left(\frac{17}{18}\pi - \pi\right)$

$= \sin(\pi-1) + \cos(\pi-1)\left(-\frac{\pi}{18}\right)$

3. Let $f(x) = x\sqrt{4-x}$, on $[-2, 4]$. Find the local and absolute maxima and minima.

$f'(x) = \sqrt{4-x} + \frac{-x}{2\sqrt{4-x}} = \frac{2(4-x)-x}{2\sqrt{4-x}} = \frac{8-3x}{2\sqrt{4-x}}$

critical points & endpoints — $-2, \frac{8}{3}, 4$.

$f(-2) = -2\sqrt{6}$, $f\left(\frac{8}{3}\right) = \frac{8}{3}\sqrt{\frac{4}{3}}$, $f(4) = 0$

absolute max: $x = \frac{8}{3}$ local min: $x = 4$

absolute min: $x = -2\sqrt{6}$