Name:_____ Date:_____

AP Calc AB: More Local Linear Approximations Ms. Loughran

1. Approximately how much less than 4 is $\sqrt[3]{63}$?

   (a) $\frac{1}{48}$ (b) $\frac{1}{16}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$ (e) 1

2. The best linear approximation for $f(x)=\tan x$ near $x=\frac{\pi}{4}$ is

   (a) $1+\frac{1}{2}(x-\frac{\pi}{4})$ (b) $1+(x-\frac{\pi}{4})$ (c) $1+\sqrt{2}(x-\frac{\pi}{4})$

   (d) $1+2(x-\frac{\pi}{4})$ (e) $2+2(x-\frac{\pi}{4})$

3. When h is near zero, e^{kh}, using local linearization, is approximately

   (a) k (b) kh (c) 1 (d) $1+k$ (e) $1+kh$

4. If $f(6)=30$ and $f'(x)=\frac{x^2}{x+3}$, then an estimate of $f(6.02)$, using the local linearization, is

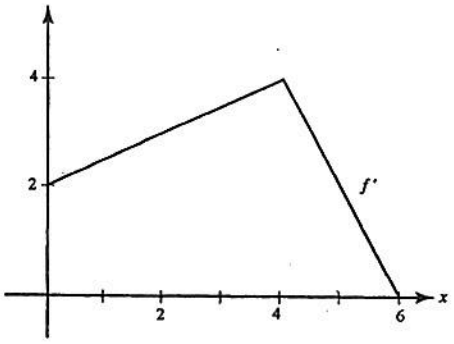
   (a) 29.92 (b) 30.02 (c) 30.08 (d) 34.00 (e) none of these

5. The tangent line approximation for $f(x)=\sqrt{x^2+16}$ near $x=-3$ is

   (a) $5-\frac{3}{5}(x-3)$ (b) $5+\frac{3}{5}(x-3)$ (c) $5-\frac{3}{5}(x+3)$

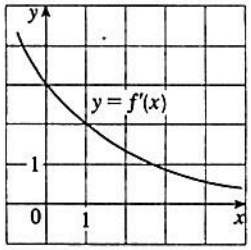
   (d) $3-\frac{5}{3}(x-3)$ (e) $3+\frac{3}{5}(x+3)$

6. The graph of f' is shown below. If we know that $f(2)=10$, then the local linearization of f at $x=2$ is $f(x)\approx$



   (a) $\frac{x}{2}+2$ (b) $\frac{x}{2}+9$ (c) $3x-3$ (d) $3x+4$ (e) $10x-17$

7. Suppose that the only information we have about a function, f, is that $f(1) = 5$ and the graph of its derivative is as shown.
   (a) Use a linear approximation to estimate $f(0.9)$ and $f(1.1)$.
   (b) Are your estimates in part (a) too large or too small? Explain.



8. Suppose that we don't have a formula for $g(x)$ but we know that $g(2) = -4$ and $g'(x) = \sqrt{x^2 + 5}$ for all x.
   (a) Use a linear approximation to estimate $g(1.95)$ and $g(2.05)$.
   (b) Are your estimates in part (a) too large or too small? Explain.