Name: Section: 5 6 9 10

1. Find the 3rd order Taylor polynomial $T_3(x)$ for $f(x) = (2+x)^{5/2}$ at $a = 2$. You do not have to simplify your answer.

$f(x) = (2+x)^{5/2} \Rightarrow f(2) = 4^{5/2} = 32$

$f'(x) = \frac{5}{2}(2+x)^{3/2} \Rightarrow f'(2) = \frac{5}{2} \cdot 4^{3/2} = 20$

$f''(x) = \frac{15}{4}(2+x)^{1/2} \Rightarrow f''(2) = \frac{15}{4} 4^{1/2} = \frac{15}{2}$

$f'''(x) = \frac{15}{8}(2+x)^{-1/2} \Rightarrow f'''(2) = \frac{15}{8} 4^{-1/2} = \frac{15}{16}$

$T_3(x) = 32 + 20(x-2) + \frac{15/2}{2!}(x-2)^2 + \frac{15/16}{3!}(x-2)^3$