

No calculators will be allowed and no partial credit will be given.

1. Find the Taylor polynomial of degree 3 for $h(x) = \sin(x)$ centered at $\frac{\pi}{4}$.
2. Find the Taylor polynomial of degree 3 for $g(x) = -3 \ln(2x)$ centered at $\frac{1}{2}$.
3. Find the Taylor polynomial of degree 3 for $f(x) = \sqrt{3}\sqrt{x}$ centered at $\frac{1}{3}$.
4. Find the Taylor polynomial of degree 3 for $g(x) = \frac{1}{(2-x)^4}$ centered at 1.
5. Find the Taylor polynomial of degree 4 for $h(x) = 3(x-3)^6$ centered at 2.

1. $\frac{\sqrt{2}}{2} + \frac{\sqrt{2} \left(x - \frac{\pi}{4}\right)}{2} - \frac{\sqrt{2} \left(x - \frac{\pi}{4}\right)^2}{4} - \frac{\sqrt{2} \left(x - \frac{\pi}{4}\right)^3}{12}$

2. $-6 \left(x - \frac{1}{2}\right) + 6 \left(x - \frac{1}{2}\right)^2 - 8 \left(x - \frac{1}{2}\right)^3$

3. $1 + \frac{3 \left(x - \frac{1}{3}\right)}{2} - \frac{9 \left(x - \frac{1}{3}\right)^2}{8} + \frac{27 \left(x - \frac{1}{3}\right)^3}{16}$

4. $1 + 4(x - 1) + 10(x - 1)^2 + 20(x - 1)^3$

5. $3 - 18(x - 2) + 45(x - 2)^2 - 60(x - 2)^3 + 45(x - 2)^4$