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1. Find the radius of convergence of the power series $\sum_{n=0}^{\infty} \frac{(n!)^2(x-3)^n}{(2n+1)!}$. What are the endpoints of the interval of convergence? How would you know if the series converged at the endpoints (do not actually test this)? (4 points)

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2. Suppose that the following table gives points on the function $f(x)$. If $P_2 = a + bx + cx^2$ is the second degree Taylor polynomial for $f(x)$ about $x = 0$, **(a)** are a , b and c positive or negative?, and **(b)** what are (reasonable estimates for) a and b ? (3 points)

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|--------|-------|------|------|
| x | -0.15 | 0 | 0.15 |
| $f(x)$ | 3.125 | 3.25 | 3.55 |

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3. Find an expression for the general term of the Taylor series $\sin(x) \cos(x) = \frac{x}{2} - \frac{x^3}{2(3!)} + \frac{x^5}{2(5!)} - \frac{x^7}{2(7!)} + \dots$ and give the starting value of the index (n). (3 points)