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13. What infinite power series is equal to $f(x) = \sin(x^2)$ about $a = 0$? (A different way to phrase the same problem is, "Find the Taylor series for $f(x) = \sin(x^2)$ about $a = 0$ ".)

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

$$\sin(x^2) = x^2 - \frac{x^6}{3!} + \frac{x^{10}}{5!} - \frac{x^{14}}{7!} + \dots$$



14. Find a closed formula for $\sum_{k=3}^{76} 3^k = 3^3 + 3^4 + 3^5 + 3^6 + \dots + 3^{76}$. (Your answer should not have any summation signs and should not have any dots.)

$$\text{sum} - 3 \text{ sum} = 3^3 - 3^{76}$$

$$\text{sum} = \frac{3^3 - 3^{76}}{1 - 3}$$

