6. [9 points]

    a. [3 points] Find the first three nonzero terms in the Taylor series for $\dfrac{1}{\sqrt{1-x^2}}$ centered at $x = 0$.

    b. [4 points] Use your answer from part (a) to find the first three nonzero terms in the Taylor series for $\arcsin(2x)$ centered at $x = 0$. Recall that $\dfrac{d}{dx}\arcsin(x) = \dfrac{1}{\sqrt{1-x^2}}$.

    c. [2 points] Find the values of x for which the Taylor series from part (b) converges.