1. Using Newton’s method to approximate a solution of the equation \( \cos x = x \) with the initial guess taken to be \( x_0 = \pi/2 \), what will be the next value, \( x_1 \), generated by the formula?
2. The closed curve $x^4 + y^4 = 1$ looks like a slightly squashed circle and surrounds a region $R$. Find the rectangle of largest area inscribed in the region $R$.

3. Given that $F(x) = \int_0^{x^2+2x} \sqrt{1 + t^{43}}dt$, find $F'(x)$. 
4. The function \( f(x) = \frac{x^2 - 2x - 2}{x - 3} \) is asymptotic to a line \( y = mx + c \). Find \( m, c \) and sketch \( f \) over the range \([0, 5]\), indicating all local extrema.

5. Sketch the curve \( y = |(x - 1)^3| \) and find the area under it, over the interval \([0, 2]\).
6. Given that \( f(x) = x^3 \sqrt{1 - x^4} \),

(a) evaluate the integral of \( f \) over the interval \([0, 1]\)

(b) write down the \textit{Mathematica} input required to compute this integral.

7. A vehicle travelling at 60 \( m/s \) applies constant deceleration \( a \) and comes to a stop after travelling a further distance of 100 \( m \). What was the constant deceleration?