1. Find a constant $c$ that satisfies the conclusion of the mean value theorem when applied to $f(x) = x^4 - x$ on $[-1, 1]$.

2. Suppose that $f$ is differentiable on $\mathbb{R}$ and satisfies $2 \leq f'(x) \leq 6$ for all values of $x$. Then find $a$ and $b$, where $a \leq f(5) - f(3) \leq b$. 
3. Find the critical point(s) of \( f(x) = \frac{x^2 + 3}{\sqrt{2x + 1}} \)

4. Find the absolute maximum and minimum of \( f(x) = \cos^2 x - \cos x, \quad -\frac{\pi}{2} \leq x \leq \pi \)
5. If the function \( f(x) = axe^{bx^2} \) has the maximum value \( f(2) = 1 \) where \( a \) and \( b \) are real numbers, then find \( a \) and \( b \).