Calculate the derivative

1. $\dfrac{3x^2 - 4x\sqrt[3]{x^2}}{2\sqrt{x}}$.

2. $\dfrac{2-x^2}{2x^3+x+3}$.

Find extrema and monotonicity intervals

3. $f(x) = (x^2 - 3)e^x$.

4. $f(x) = x^2 lnx$.

5. $f(x) = x^2 lnx$.

6. $f(x) = lnx + \dfrac{1}{lnx}$.

7. $f(x) = x - 2lnx$.

8. $f(x) = \dfrac{1+lnx}{x}$.