

Compute the derivatives:

1. $\frac{d}{dx} e^{\frac{1}{x}}.$

2. $\frac{d}{dx} \frac{\ln(x+2)}{x^2}.$

3. $f(x) = \cos(2x)(\sin(x))^2.$

4. $f(x) = \cos(\sqrt{1-x^2})$