Derivatives of Log/Exp

Find the derivative of each function

1. $y = x^2 \ln(x-8)$ 2. $y = xe^{1-x}$ 3. $y = e^{x^2} \tan(2x)$

4. $y = \sin^2 x \cos(\ln x)$ 5. $y = \dfrac{xe^x}{1+e^x}$ 6. $y = \ln(\cos x)$

7. $y = e^{x^{1/2} - \ln x}$ 8. $y = \sin\left(\ln x + xe^{\sqrt{x}}\right)$ 9. $y = 2^{e^{x^2}}$

10. $y = 5^{-\arccos x}$ 11. $y = \log_4(x^2 - 4x)$ 12. $y = \log_6 \sqrt{(x^2 + 1)}$