Compute the integrals.

1. $\int_{0}^{3} 40 - 2t^2 \, dt$
   
   Solution: We get
   $$\int_{0}^{3} 40 - 2t^2 \, dt = \left[ 40t - \frac{2t^3}{3} \right]_{0}^{3} = 120 - 18 = 102.$$

2. $\int 6e^{2x} \, dx$
   
   Solution: Since we know $\frac{d}{dx} e^{2x} = 2e^{2x}$, we guess that $3e^{2x}$ might be an antiderivative of $6e^{2x}$. We check that
   $$\frac{d}{dx} 3e^{2x} = 3 \times 2e^{2x} = 6e^{2x},$$
   so we were right. We get
   $$\int 6e^{2x} \, dx = 3e^{2x} + C.$$

3. $\int_{2}^{4} \frac{x^3 + 2x}{x^2} \, dx.$
   
   Solution: We have
   $$\int_{2}^{4} \frac{x^3 + 2x}{x^2} \, dx = \int_{2}^{4} x + \frac{2}{x} \, dx = \left[ \frac{x^2}{2} + 2 \ln \vert x \vert \right]_{2}^{4} = (8 + 2 \ln 4) - (2 + 2 \ln 2) = 6 + 2(\ln 4 - \ln 2) = 6 + 2 \ln 2.$$