Integrate each of the following by hand.

1. $\displaystyle \int x\sqrt{x^2 + 2}\,dx$

2. $\displaystyle \int xe^{-x^2}\,dx$

3. $\displaystyle \int \frac{x}{\sqrt{x^2 + 2}}\,dx$

4. $\displaystyle \int w^2\left(w^3 + 1\right)\,dw$

5. $\displaystyle \int (5x + 1)^{12}\,dx$

6. $\displaystyle \int e^{4x-12}\,dx$

7. $\int \dfrac{e^x - e^{-x}}{e^x + e^{-x}}\,dx$

8. $\int \dfrac{(\ln(w))^2}{w}\,dw$

9. $\int \dfrac{e^{\sqrt{x}}}{\sqrt{x}}\,dx$

10. $\int x\left(3x^2 - 12\right)^{1/3}\,dx$