Find the following antiderivatives and *verify your answers!*

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

2. $\displaystyle \int \frac{2x}{1 + x^4} \, dx$

3. $\displaystyle \int \frac{1}{\sqrt{x}} \, dx$

4. $\displaystyle \int \frac{1}{\sqrt{1 - x^2}} \, dx$

5. $\displaystyle \int \frac{1}{\sqrt{1 - x}} \, dx$

Recap for Today

- $\frac{d}{dx} \arcsin(x) = \dfrac{1}{\sqrt{1 - x^2}}$

- $\frac{d}{dx} \arctan(x) = \dfrac{1}{1 + x^2}$

- It is very surprising that the inverse trig functions are antiderivatives of ordinary algebraic functions.