$$
\begin{aligned}
f(x) &= f(0) + xf'(0) + \frac{1}{2}x^2 f''(0) + \frac{1}{3!}x^3 f'''(0) + \cdots \\
(a+x)^\gamma &= a^\gamma + \gamma x a^{\gamma-1} + \frac{1}{2}\gamma(\gamma-1)x^2 a^{\gamma-2} + \frac{1}{3!}\gamma(\gamma-1)(\gamma-2)x^3 a^{\gamma-3} + \cdots \\
\frac{1}{1+x} &= 1 - x + x^2 - x^3 + \cdots \\
\frac{1}{(1+x)^2} &= 1 - 2x + 3x^2 - 4x^3 + \cdots \\
\sqrt{1+x} &= 1 + \frac{1}{2}x - \frac{1}{8}x^2 + \frac{1}{16}x^3 + \cdots \\
\frac{1}{\sqrt{1+x}} &= 1 - \frac{1}{2}x + \frac{3}{8}x^2 - \frac{5}{16}x^3 + \cdots \\
e^x &= 1 + x + \frac{1}{2}x^2 + \frac{1}{3!}x^3 + \cdots \\
\sin(x) &= x - \frac{1}{3!}x^3 + \frac{1}{5!}x^5 - \cdots \\
\cos(x) &= 1 - \frac{1}{2}x^2 + \frac{1}{4!}x^4 + \cdots \\
\sin(a+x) &= \sin(a) + x\cos(a) - \frac{1}{2}x^2\sin(a) - \frac{1}{6}x^3\cos(a) + \cdots \\
\cos(a+x) &= \cos(a) - x\sin(a) - \frac{1}{2}x^2\cos(a) + \frac{1}{6}x^3\sin(a) + \cdots \\
\ln(1+x) &= x - \frac{1}{2}x^2 + \frac{1}{3}x^3 + \cdots \\
\ln(a+x) &= \ln(a) + \ln(1+x/a) = \ln(a) + \frac{x}{a} - \frac{1}{2}\left(\frac{x}{a}\right)^2 + \frac{1}{3}\left(\frac{x}{a}\right)^3 + \cdots
\end{aligned}
$$

Table 2.1: Taylor series expansions, about $x = 0$, for some of the more commonly used functions.