1. (5 points) (Quotient Rule) Let $u$ and $v$ be differentiable functions. The derivative of the quotient, $\frac{d}{dx} \left( \frac{u}{v} \right)$ is

**Solution:**

$$\frac{d}{dx} \left( \frac{u}{v} \right) = \frac{vu' - uv'}{v^2}.$$

2. (5 points) Let $f(x) = 3x^2 - 2x + \sqrt{x} - e^\pi + 3\sqrt{2} + \cos(x)$. Compute $f'(x)$.

**Solution:** Note that $e^\pi$ and $3\sqrt{2}$ are constants and so have derivative equal to 0. We can write $\sqrt{x}$ as $x^{1/2}$ and use the power rule to differentiate the remaining terms.

$$f'(x) = 6x - 2 + \frac{1}{2}x^{-1/2} - \sin(x).$$