1. Verify that the line $y = 2x - 3$ from $x = 1$ to $x = 5$ has length $4\sqrt{5}$

   (a) using the Pythagorean Theorem directly;

   (b) using the arc length formula.

2. (**) Find the length of the curve $x = 3y^{4/3} - \frac{3}{32}y^{2/3}$ from $y = 1$ to $y = 8$. Simplify your answer.

3. **Set up** an integral for the length of each curve. (You can try to evaluate the integrals later, if possible.)

   (a) $y = \sin x$ from $x = 0$ to $x = \frac{\pi}{2}$

   (b) $y = \frac{1}{x}$ from $x = 1$ to $x = 4$

   (c) (*) $y = \ln(\cos x)$ from $x = 0$ to $x = \frac{\pi}{3}$

   (d) $x = y^2 + 5$ from $y = -1$ to $y = 3$

   (e) (*) $x = \sqrt[4]{5y - 1}$ from $y = 2$ to $y = 4$

   (f) (*) $x = y \ln y$ from $y = 1$ to $y = 2$