Arc Length Formula	**Explanation**
$L = \int_a^b \sqrt{1 + [f'(x)]^2}\, dx$	Arc length of "nice functions" with respect to x.

1. Find the length of the following curves.
   (a) $\frac{3}{4}x - \frac{1}{4}$, $-1 \leq x \leq 3$.

   (b) $12x = 4y^3 + 3y^{-1}$, $1 \leq y \leq 3$.

2. Find b such that the length of the curve $y = 1 + 6x^{3/2}$, $0 \leq x \leq b$, is 6.

Surface Area Formula	**Explanation**
$S = \int_a^b 2\pi f(x)\sqrt{1+[f'(x)]^2}\,dx$	Surface area of "nice functions" rotated about the y-axis.

3. Find the surface areas obtained in the following situations.
   (a) rotating the curve $f(x) = \sqrt{1+e^x}$ for $0 \leq x \leq 1$ around the x-axis.

   (b) rotating the curve $f(y) = \sqrt{a^2-y^2}$ for $0 \leq y \leq a/2$ and a constant around the y-axis