(2) $l = ?$ $\quad g = x^{\frac{3}{2}} \quad 0 \le x \le 4$

$$\boxed{l = \int_a^b \sqrt{1 + (f'(x))^2}\, dx}$$

$g' = \frac{3}{2} \cdot x^{\frac{1}{2}}$

$(g')^2 = \frac{9}{4} x$

$$l = \int_0^4 \sqrt{1 + \frac{9}{4}x}\, dx = \left| \begin{array}{l} 1 + \frac{9}{4}x = t \\ \frac{9}{4}\, dx = dt \\ \begin{array}{c|c|c} x & 0 & 4 \\ \hline t & 1 & 10 \end{array} \\ dx = \frac{4}{9} dt \end{array} \right|$$

$$= \int_1^{10} \sqrt{t} \cdot \frac{4}{9}\, dt =$$

$$= \frac{4}{9} \int_1^{10} t^{\frac{1}{2}}\, dt = \frac{4}{9} \left[\frac{t^{\frac{3}{2}}}{\frac{3}{2}} \right]_1^{10} = \frac{4}{9} \cdot \left[\frac{2}{3} t^{\frac{3}{2}} \right]_1^{10} =$$

$$= \frac{4}{9} \cdot \frac{2}{3} \left[t^{\frac{3}{2}} \right]_1^{10} = \frac{8}{27} \cdot \left[\sqrt{1000} - 1 \right] =$$

$$= \frac{8}{27} \cdot \left(10\sqrt{10} - 1 \right) \doteq 9{,}073$$