Problem:

Find the general integral of the differential equation:

$$x\sqrt{4 + y^2}\,dx + y\sqrt{1 + x^2}\,dy = 0.$$

Solution:

This is an equation with separable variables:

$$\frac{y\,dy}{\sqrt{4 + y^2}} = -\frac{x\,dx}{\sqrt{1 + x^2}}, \Rightarrow \text{let's integrate, } \int \frac{y\,dy}{\sqrt{4 + y^2}} = -\int \frac{x\,dx}{\sqrt{1 + x^2}}, \qquad \frac{1}{2}\int \frac{dy^2}{\sqrt{4 + y^2}} = -\frac{1}{2}\int \frac{dx^2}{\sqrt{1 + x^2}},$$

$\sqrt{4 + y^2} = -\sqrt{1 + x^2} + C$, where C is the arbitrary constant $\Rightarrow$ we have obtained the desired general integral of the equation:

$$\sqrt{4 + y^2} + \sqrt{1 + x^2} = C.$$

Answer: $\sqrt{4 + y^2} + \sqrt{1 + x^2} = C.$