$$\int_3^8 \frac{1}{\sqrt{x-3}}\,dx = \lim_{t\to 3^+} \int_t^8 \frac{1}{\sqrt{x-3}}\,dx$$

Indef $\int \frac{1}{\sqrt{x-3}}\,dx \qquad u = x-3 \quad du = dx$

$$= \int \frac{1}{\sqrt{u}}\,du = \int u^{-1/2}\,du = \frac{u^{1/2}}{1/2} + C = 2\sqrt{x-3} + C$$

$$= \lim_{t\to 3^+} \left(2\sqrt{8-3} + 2\sqrt{t-3}\right)$$

$$= 2\sqrt{5} - 2\sqrt{0} = 2\sqrt{5}$$