

$$\int_3^{\infty} \frac{1}{(x-2)^{3/2}} dx$$

$$\lim_{t \rightarrow \infty} \int_3^t \frac{1}{(x-2)^{3/2}} dx$$

$$u = x - 2 \\ du = dx$$

$$\lim_{t \rightarrow \infty} \int_{*}^{*} \frac{1}{(u)^{3/2}} du$$

$$\lim_{t \rightarrow \infty} \int_{*}^{*} u^{-3/2} du = \lim_{t \rightarrow \infty} \frac{u^{-1/2}}{-1/2} \Big|_{*}^{*} = \lim_{t \rightarrow \infty} \frac{-2}{\sqrt{u}} \Big|_{*}^{*}$$

$$= \lim_{t \rightarrow \infty} \frac{-2}{\sqrt{x-2}} \Big|_3^t = \lim_{t \rightarrow \infty} \frac{-2}{\sqrt{t-2}} - \frac{-2}{\sqrt{3-2}} = 0 + \frac{2}{\sqrt{1}} = 2$$

$$\int_3^{\infty} \frac{1}{(x-2)^{3/2}} dx$$

$$\lim_{t \rightarrow \infty} \int_3^t \frac{1}{(x-2)^{3/2}} dx$$

$$u = x - 2 \\ du = dx$$

$$x = 3 \rightarrow u = 3 - 2 = 1$$

$$x = t \rightarrow u = t - 2$$

$$\lim_{t \rightarrow \infty} \int_1^{t-2} \frac{1}{(u)^{3/2}} du$$

$$\lim_{t \rightarrow \infty} \int_1^{t-2} u^{-3/2} du = \lim_{t \rightarrow \infty} \frac{u^{-1/2}}{-1/2} \Big|_1^{t-2} = \lim_{t \rightarrow \infty} \frac{-2}{\sqrt{u}} \Big|_1^{t-2}$$

$$= \lim_{t \rightarrow \infty} \frac{-2}{\sqrt{t-2}} - \frac{-2}{\sqrt{1}} = 0 + 2 = 2$$