$$\int_4^{\infty} \frac{6}{\sqrt{x}-1}\,dx$$

Intuition? $\frac{1}{\sqrt{x}-1} \approx \frac{1}{\sqrt{x}} = \frac{1}{x^{1/2}}$. I know $\int_4^{\infty} \frac{1}{x^{1/2}}\,dx$ diverges

$p = \frac{1}{2}$ $p \leq 1$.

So $\int_4^{\infty} \frac{6}{\sqrt{x}-1}\,dx$ probably diverges but to use the Comparison Theorem,

I need to find $g(x)$ such that $\frac{6}{\sqrt{x}-1} \geq g(x)$, and $\int_4^{\infty} g(x)$ diverges

$$-1 \leq 0$$

$$\sqrt{x} - 1 \leq \sqrt{x}$$

$$\frac{1}{\sqrt{x}-1} \geq \frac{1}{\sqrt{x}}$$

$$\frac{6}{\sqrt{x}-1} \geq \frac{6}{\sqrt{x}}$$

$\int_4^{\infty} \frac{6}{\sqrt{x}}\,dx = 6\int_4^{\infty} \frac{1}{x^{1/2}}\,dx$ diverges

By the Comparison Theorem, $\int_4^{\infty} \frac{6}{\sqrt{x}-1}\,dx$ diverges