Approach to check $s \equiv_{\mathcal{E}} t$:

1. Generate a TRS $\mathcal{R}$ that is equivalent to $\mathcal{E}$.

2. Reduce s and t as much as possible:

   $$s \to_{\mathcal{R}} s_1 \to_{\mathcal{R}} s_2 \to_{\mathcal{R}} \ldots \to_{\mathcal{R}} s_n \qquad \text{and} \qquad t_m \leftarrow_{\mathcal{R}} \ldots \leftarrow_{\mathcal{R}} t_2 \leftarrow_{\mathcal{R}} t_1 \leftarrow_{\mathcal{R}} t$$

   i.e., s has the normal form $s{\downarrow_{\mathcal{R}}} = s_n$, t has the normal form $t{\downarrow_{\mathcal{R}}} = t_m$

3. If $s_n = t_m$, then return "*True*", else "*False*".

Prerequisites:

- $\mathcal{R}$ *terminates*,
  i.e., $\to_{\mathcal{R}}$ is *well founded*,
  i.e., no infinite reduction $t_0 \to_{\mathcal{R}} t_1 \to_{\mathcal{R}} \ldots$

- $\mathcal{R}$ has the *Church-Rosser property*, i.e., $s \leftrightarrow_{\mathcal{R}}^* t$ implies $s \to_{\mathcal{R}}^* q \leftarrow_{\mathcal{R}}^* t$.