PageRank example
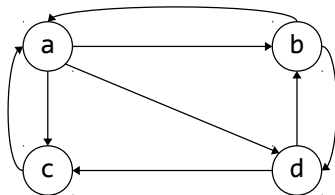
$$r_i = \sum_{j:j\to i\in\mathcal{E}} \frac{r_j}{d_j}$$

Equations:

- $r_a = \frac{r_b}{2} + r_c$.
- $r_b = \frac{r_a}{3} + \frac{r_d}{2}$.
- $r_c = \frac{r_a}{3} + \frac{r_d}{2}$.
- $r_d = \frac{r_a}{3} + \frac{r_b}{2}$.

– 4 equations, 4 unknowns, no constants.

No **unique solution:** all solutions are equivalent modulo a scale factor.

– Additional **constraint** for uniqueness:

$$\sum_i r_i = 1.$$

– **Solution** by **Gaussian elimination:**

- $r_a = \frac{1}{3}$.
- $r_b = r_c = r_d = \frac{2}{9}$.