

### 26.5 Tracker solution.

Inserting the ansatz

$$\phi(t) = C(\alpha, n) M^{1+\nu} t^\nu \quad (401)$$

into the ODE

$$\ddot{\phi} + \frac{3\alpha}{t} \dot{\phi} - \frac{M^{4+n}}{\phi^{n+1}} = 0 \quad (402)$$

gives

$$CM^{1+\nu} \nu(\nu-1) t^{\nu-2} + CM^{1+\nu} \frac{3\alpha}{t} t^{\nu-1} - \frac{M^{4+n}}{C^{n+1} M^{(n+1)(1+\nu)} t^{\nu(n+1)}} = 0 \quad (403)$$

$$CM^{1+\nu} [\nu(\nu-1) + 3\alpha] t^{\nu-2} - \frac{M^{3-\nu(n+1)}}{C^{n+1}} t^{-\nu(n+1)} = 0 \quad (404)$$

From equating coefficients and powers (in  $t$ ) we obtain

$$\nu = \frac{2}{2+n} \quad (405)$$

$$C(\alpha, n) = \left( \frac{(2+n)^2}{6\alpha(2+n) - 2n} \right)^{\frac{1}{2+n}}. \quad (406)$$