

STEP III, 2002 Q6

- 6 Find all the solution curves of the differential equation

$$y^4 \left(\frac{dy}{dx} \right)^4 = (y^2 - 1)^2$$

that pass through either of the points

(i) $\left(0, \frac{\sqrt{3}}{2} \right)$,

(ii) $\left(0, \frac{\sqrt{5}}{2} \right)$.

Show also that $y = 1$ and $y = -1$ are solutions of the differential equation. Sketch all these solution curves on a single set of axes.



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