$$\Rightarrow y_p = uy_1 + vy_2 = \frac{e^{ax}\cos bx\int -re^{-ax}\sin bx\,dx + e^{ax}\sin bx\int re^{-ax}\cos bx\,dx}{b}.$$

Therefore the general solution (in the case $b \neq 0$) of the ODE

$$y'' - 2ay' + \left(a^2 + b^2\right)y = r(x)$$

is

$$y(x) = \left(A\cos bx + B\sin bx + \frac{\sin bx\int re^{-ax}\cos bx\,dx - \cos bx\int re^{-ax}\sin bx\,dx}{b}e^{ax}\right).$$

and it is a nice exercise to show that this solution tends to the equal roots case in the limit as $b \to 0$.

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DEAR EDITOR,

The ladder problem

Readers of *Gazette* Note 91.43 may be interested in an article [1] on a similar theme which appeared around the same time, in which the author solves the ladder problem and various generalisations, including the couch problem, using envelopes of families of curves.

As the author remarks: 'The standard solution begins with a twist, transforming the problem from maximization to minimisation. This bit of misdirection no doubt contributes to the appeal of the problem. But it fairly compels the question, is there a direct approach?

In fact there is a beautifully simple direct approach that immediately gives new insights about the problem.'

Yours sincerely,

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Reference

1. Solving the Ladder Problem on the Back of an Envelope, Dan Kalman, *Mathematics Magazine*, **80** (3) June 2007.

The answers to the *Nemo* page on Love from March were as follows:

1.	EB Browning	*Sonnets from the Portuguese*
2.	Stanislaw Lem	*Love and tensors*
3.	Peter Hoeg	*Miss Smilla's feeling for snow*
4.	John Banville	*Birchwood*
5.	WJ Rankine	*The mathematician in love*
6.	Langston Hughes	*Addition*

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