

STEP 2006, P2 – Notes / Solutions (2 pages; 17/5/18)

See separate documents for Sol'ns.

(N): brief comment only

1	2	3	4	5	6	7	8
	Sol'n		Sol'n		Sol'n		(N)

9	10	11		12	13	14
N				Sol'n	N	N

STEP 2006, P2, Q8

An unusually large amount of algebra for a vector question.

STEP 2006, P2, Q9

In the official 'Hints and Answers': "(previously ignored when the ladder was on the ground)" should presumably read "(previously ignored when the table was fixed to the ground)"

Although the official report says that this type of question is 'pretty standard', you could easily take a long time over it, unless you were very practised at this topic, and were confident that you understood what was going on. However it is the case that the answer is always obtained by resolving forces in 2 perpendicular directions and taking moments.

STEP 2006, P2, Q13

The 'Hints and Answers' maintain that this was a counting question (involving 24 possibilities), but the probability approach

seems in fact to be a lot quicker. Also, it isn't clear how a counting approach can 'point you in the right direction' for part (ii).

STEP 2006, P2, Q14

Questions on pdfs are strongly recommended. They usually only rely on the fact that $\int_{-\infty}^{\infty} f(x) dx = 1$, and are easily identifiable. They often turn out to be Pure Maths questions, in effect.

In (iii), it seems a bit harsh to have expected candidates to have expanded $\ln(1+x)$ to the term in x^4 (if you stop at x^3 it is still possible to reach the answer, by a suitable approximation).

Part (iv) should arouse suspicions and encourage the value of b to be investigated. The value of the probability can only be different from the answer to (iii) if b is $< e^2$ – though in fact it turns out to be $< e^{\frac{3}{2}}$ as well.