STEP 2005, Paper 2 - Notes (2 pages; 11/5/18)

See separate documents for Sol'ns.

(N): brief comment only

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

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

Q2 Low-risk question, in the sense that there are no results that are difficult to check.

Q3 It can be assumed that $\frac{dy}{dx}$ needs to be investigated for any sketch (if only the sign of $\frac{dy}{dx}$ and when $\frac{dy}{dx} = 0$). The Examiners' Report reveals that many candidates came unstuck somewhere in (ii) - presumably due to the volume of working required (though this isn't excessive by STEP standards). Note how it is possible for an essentially straightforward question on integration by parts to appear in STEP 2.

Q9 The theory is straightforward in this question, and the 2nd part is no more complicated than the 1st. The minimising of the magnitude of P involves a bit of algebra, if stationary points are used (and this has to be repeated in the 2nd part). The mark scheme uses the fact that $\frac{X}{cos\theta}$ is minimised when $\theta = \frac{\pi}{2}$.

Q12

As the mark scheme points out, the amount of writing can be reduced by adopting suitable abbreviations; in particular G (say) = ap+bq.

Parts (ii) & (iii) require the use of the conditional prob. formula: P(A/B) = P(A&B)/P(B). Part (i), being simpler, can be tackled without this: the prob. is just pa+qb. However the mark scheme makes the statement "The coin is given to be fair, so that P(α) = ½", but this ignores the conditional aspect of the probability, since, according to the mark scheme's notation (based on (ii) & (iii)), P(α) means P(Head|reply was Yes).