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1. A particle of mass 2 kg is moving with velocity $(5\mathbf{i} + 3\mathbf{j})\,\text{m s}^{-1}$ when it receives an impulse $\mathbf{I}\,\text{N s}$, such that $\mathbf{I} = a\mathbf{i} + b\mathbf{j}$

Immediately after receiving the impulse, the particle is moving with velocity $\lambda(\mathbf{i} + \mathbf{j})\,\text{m s}^{-1}$, where λ is a constant.

Given that the magnitude of $\mathbf{I}$ is $\sqrt{40}$, find the two possible impulses.

(5)

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Question 1 continued

Q1

(Total 5 marks)