5. A particle P of mass 0.5 kg is moving with velocity $6\mathbf{i}\,\text{m s}^{-1}$ in the xy plane.

The particle receives an impulse $(a\mathbf{i} + b\mathbf{j})\,\text{N s}$, where a and b are constants.

As a result of the impulse, the direction of motion of P is deflected through 45°

The impulse has magnitude $\frac{3\sqrt{2}}{2}\,\text{N s}$.

Find the two possible impulses, giving your answers in terms of **i** and **j**.

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