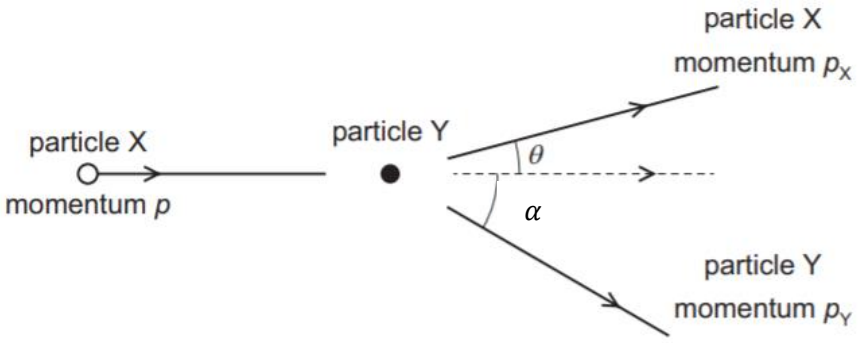
**4** A particle X has initial momentum $p$. It collides with a stationary particle Y. The particle X is deflected through angle $\theta$ and its momentum is $p_X$. The particle Y moves off at angle $\alpha$ to the original direction of motion of particle X with momentum $p_Y$ as shown.




Which equation is a correct statement for momentum in this collision?

**A** $p_X \cos\theta = p_Y \cos\alpha$

**B** $p_X \sin\theta = p_Y \sin\alpha$

**C** $p_X \cos\theta + p_Y \cos\alpha = 0$

**D** $p = p_X \sin\theta + p_Y \sin\alpha$