10. A triangle has two edges of length 5. What length should be chosen for the third side of the triangle so as to maximise the area within the triangle?

A 5 B 6 C $5\sqrt{2}$ D 8 E $5\sqrt{3}$

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10. **C** The area of a triangle is $\frac{1}{2}ab\sin C$. The maximum area is attained when $\angle C = 90°$. Hence, in order to maximise the area, the triangle must be right-angled with common side lengths equal to 5. Let x be the side length of the hypotenuse, so, by Pythagoras' Theorem, $x^2 = 5^2 + 5^2 = 50$. Thus $x = 5\sqrt{2}$ is the length that should be chosen.