10. A rectangle has area $120\,\text{cm}^2$ and perimeter 46 cm. Which of the following is the length of each of the diagonals?

A 15 cm B 16 cm C 17 cm D 18 cm E 19 cm

---

10. **C** Let the length of the rectangle be x cm and its width be y cm. The area is given as $120\ \text{cm}^2$ so $xy = 120$. The perimeter is 46 cm, so $46 = 2x + 2y$ and therefore $23 = x + y$. Using Pythagoras' Theorem, the length of the diagonal is $\sqrt{x^2 + y^2}$. As $x^2 + y^2 = (x + y)^2 - 2xy$, $\sqrt{x^2 + y^2} = \sqrt{23^2 - 2 \times 120} = \sqrt{529 - 240} = \sqrt{289} = 17$. So the diagonal has length 17 cm.