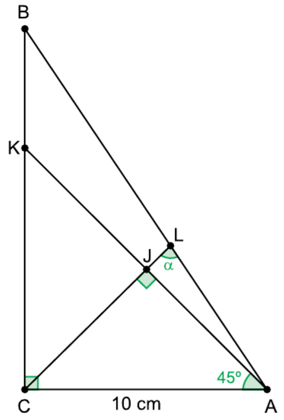
QUESTÃO 18

Em um plano, os pontos K e L estão sobre os lados do triângulo retângulo ABC e o ponto J é a intersecção dos segmentos perpendiculares $\overline{AK}$ e $\overline{CL}$, conforme mostra a figura.



Sabendo que tg $\alpha = 5$ e que $CK = 2BK$, a razão $\dfrac{AL}{AB}$ é igual a

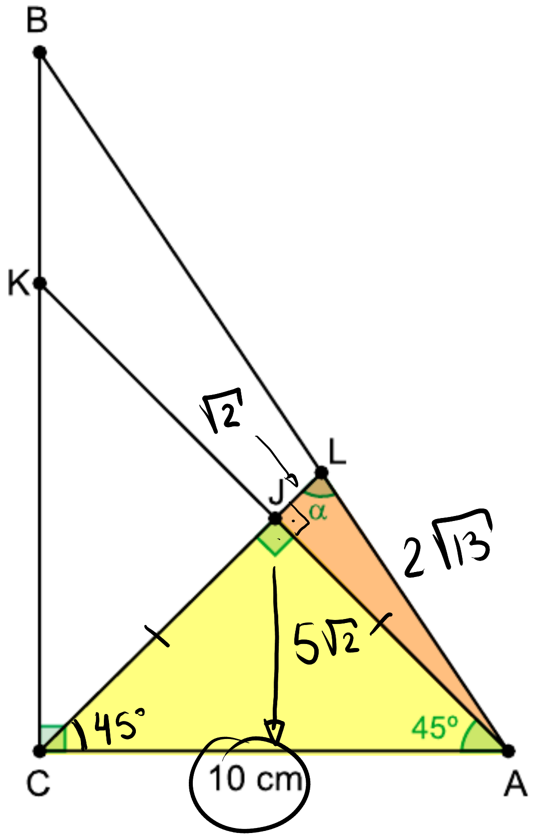
(A) $\dfrac{3}{5}$

(B) $\dfrac{3}{7}$

(C) $\dfrac{4}{7}$

(D) $\dfrac{2}{3}$

(E) $\dfrac{2}{5}$



$$tg(\alpha) = 5$$

$$tg\alpha = \frac{AJ}{JL}$$

$$(JC)^2 + (AJ)^2 = 10^2$$

$$(AJ)^2 + (AJ)^2 = 100$$

$$2(AJ)^2 = 100$$

$$(AJ)^2 = \frac{100}{2}$$

$$(AJ)^2 = 50$$

$$AJ = \sqrt{50}$$

$$AJ = 5\sqrt{2}$$

$$\frac{AJ}{JL} = 5$$

$$AJ = 5JL$$

$$\cancel{5}\sqrt{2} = \cancel{5}JL$$

$$JL = \sqrt{2}$$

$$(AL)^2 = (\sqrt{2})^2 + (5\sqrt{2})^2$$

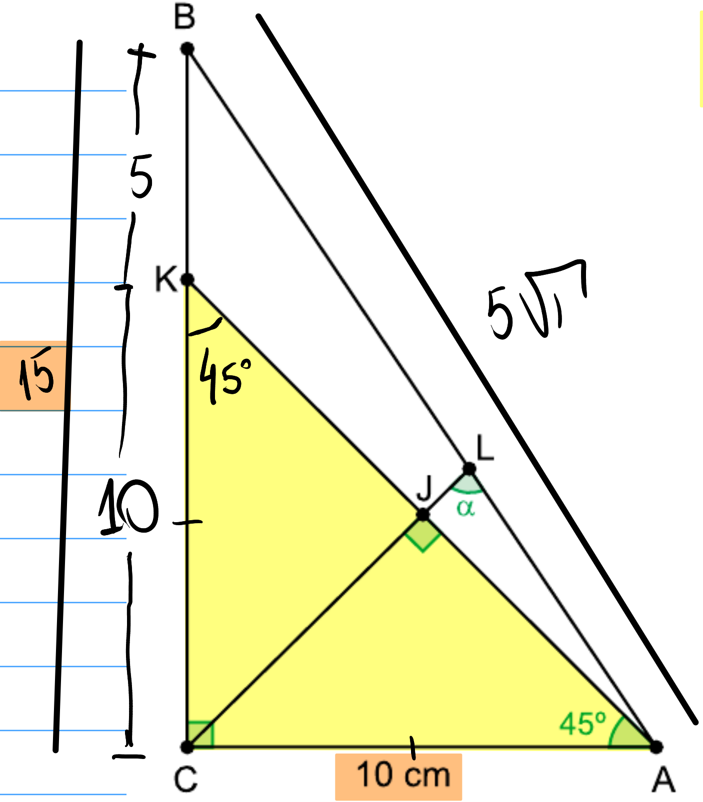
$$(AL)^2 = 2 + 50$$

$$(AL)^2 = 52$$

$$AL = \sqrt{52}$$

$$AL = \sqrt{4 \cdot 13}$$

$$AL = 2\sqrt{13}$$



$$CK = 2BK$$

$$10 = 2BK$$

$$\frac{10}{2} = BK$$

$$BK = 5$$

$$(AB)^2 = 10^2 + 15^2$$

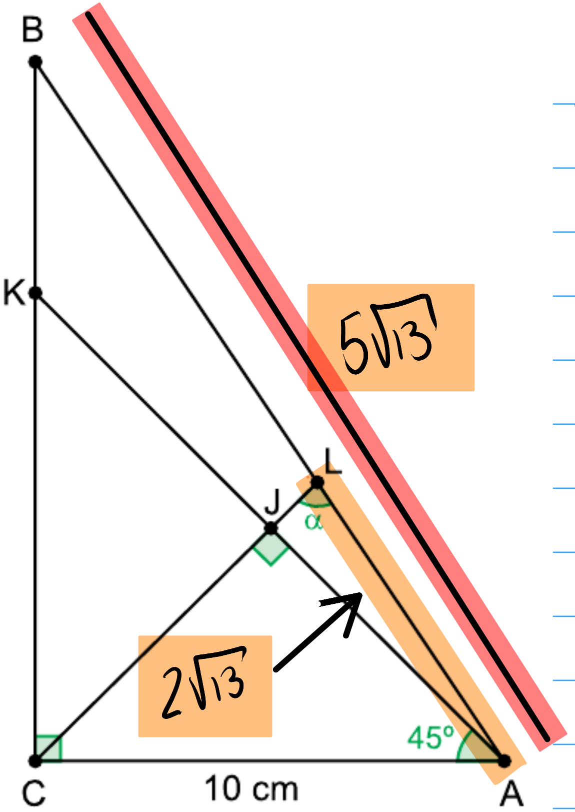
$$(AB)^2 = 100 + 225$$

$$(AB)^2 = 325$$

$$AB = \sqrt{325}$$

$$AB = \sqrt{25 \cdot 13}$$

$$AB = 5\sqrt{13}$$



$$\frac{AL}{AB} = \frac{2\cancel{\sqrt{13}}}{5\cancel{\sqrt{13}}} = \frac{2}{5}$$