Given:

Let ABC be a triangle with angle A = 90 and AB = AC. Let D and E be points on the segment
BC such that BD : DE : EC = 3 : 5 : 4. Prove that angle DAE = 45 .

Solution:

BD : DE : EC = 3 : 5 : 4 $\Rightarrow$ $\angle BAD : \angle DAE : \angle EAC = 9 : 25 : 16$

So we obtain

$9x^2 + 25x^2 + 16x^2 = 90 \quad \Rightarrow \quad 50x^2 = 90$

$x^2 = \frac{90}{50} = 1.8$

$\angle DAE = 25x^2 = 25 \cdot 1.8 = 45^0$

Answer: $\angle DAE = 45^0$