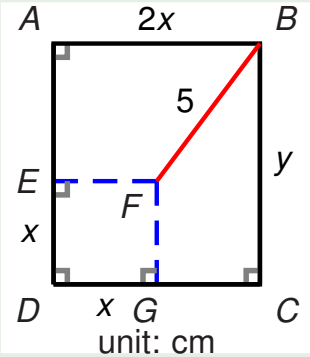
Precalculus
§ Geometric-text problems leading to polynomial systems, part 2

Todor Milev

2019

Example



ABCD is a rectangle. Points *E*, *F*, *G* and *D* form a square as indicated. Given: $|ED| = |DG| = x$ *cm* $|AB| = 2x$ *cm*, $|BC| = y$ *cm*, $|BF| = 5$ *cm*, *Perimeter*$(ABCD) = 26$ *cm*. Find x and y so that $y > x$.

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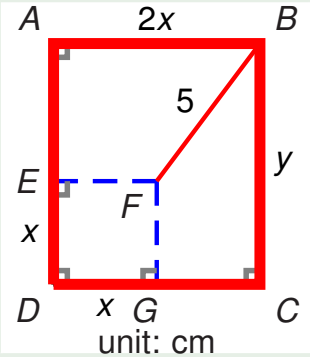

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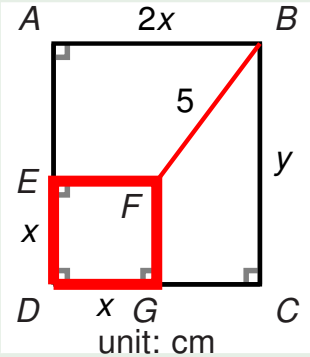

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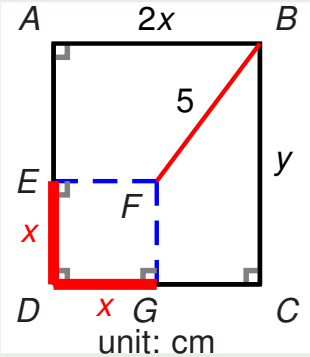

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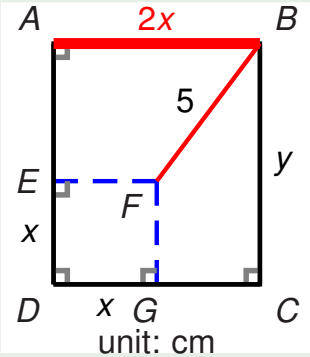

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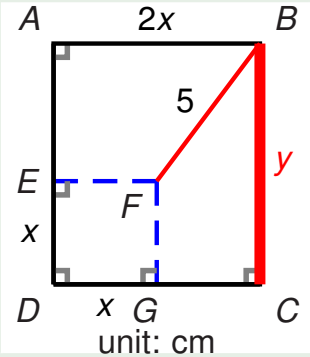

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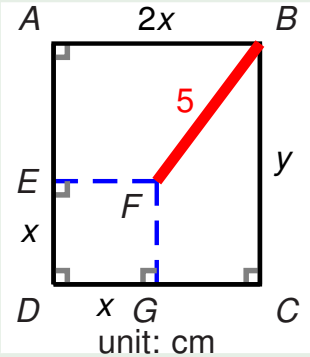

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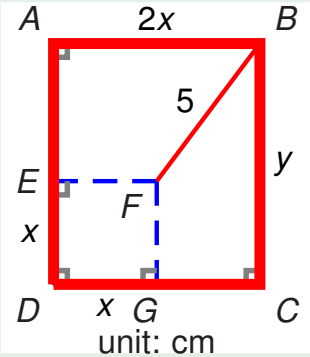

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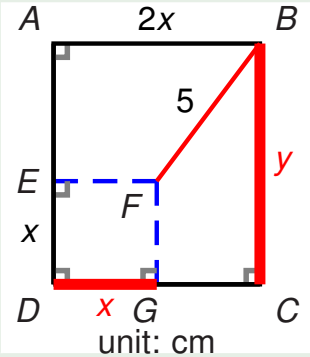

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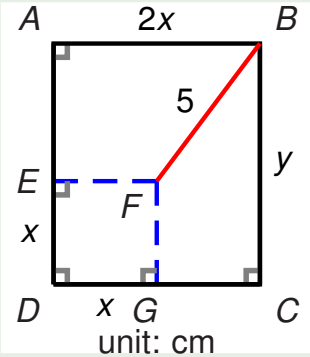

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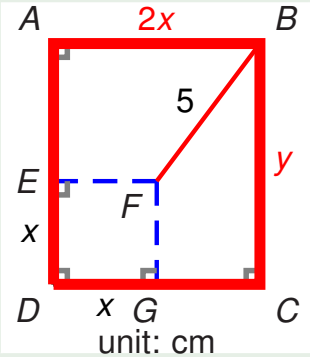

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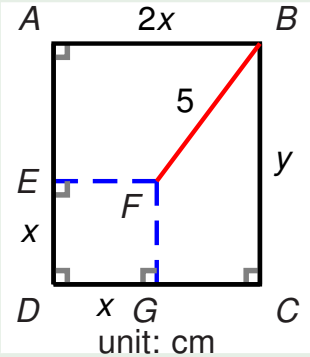

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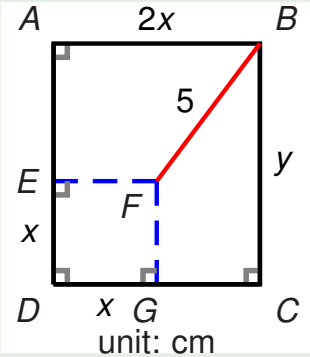

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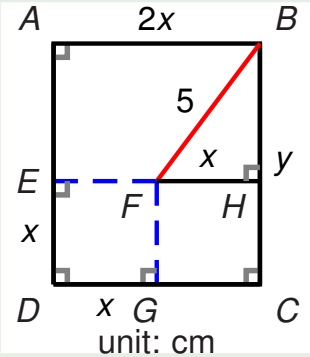

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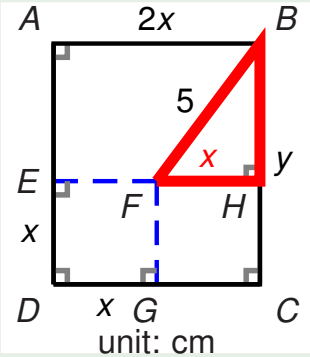

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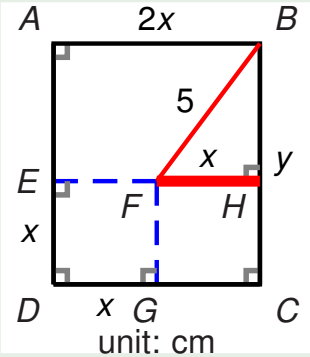

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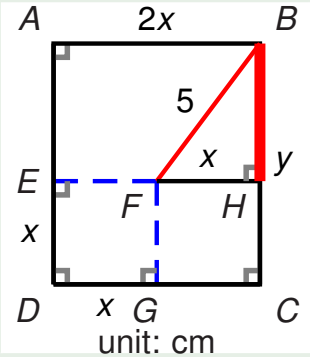

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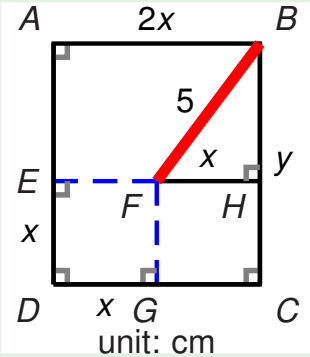

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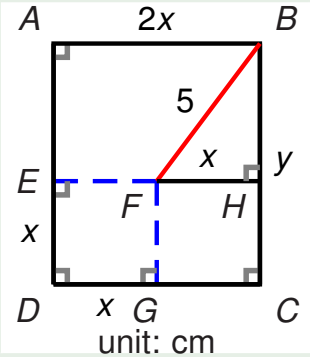

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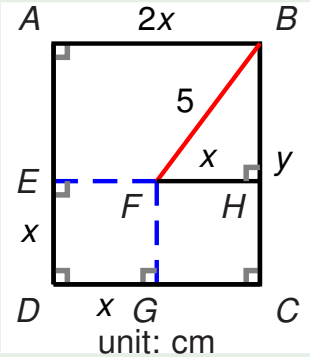

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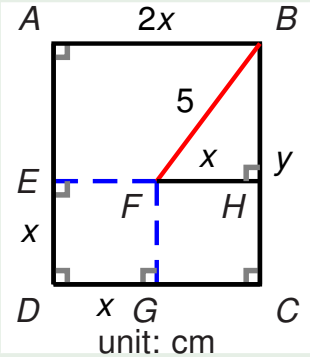

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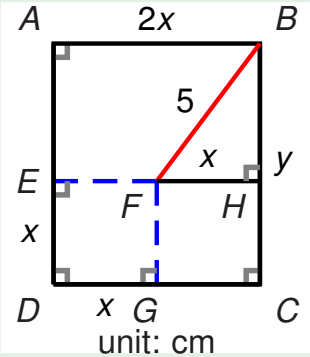

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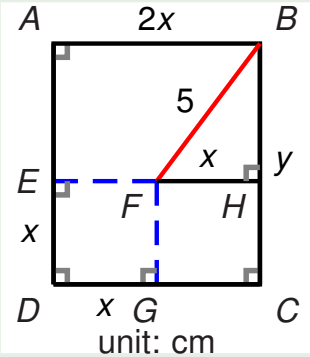

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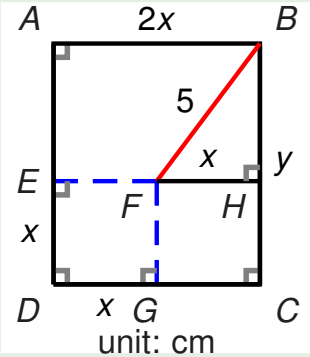

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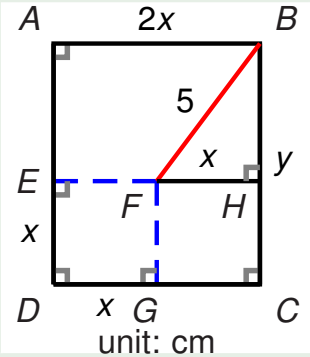

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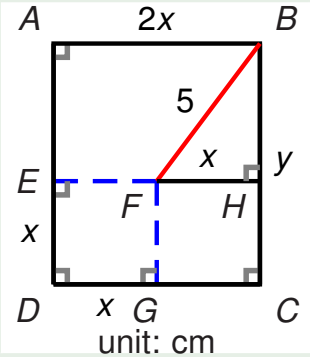

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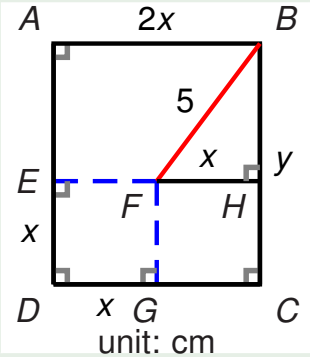

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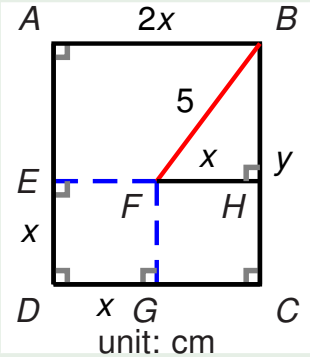

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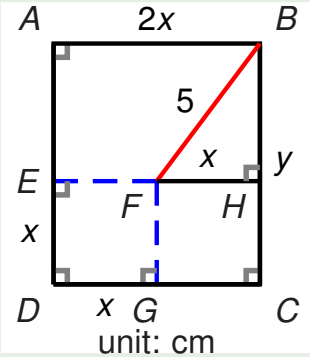

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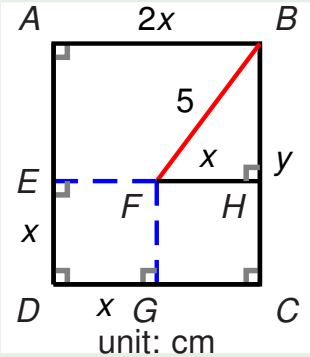

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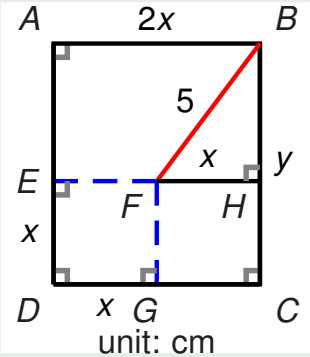

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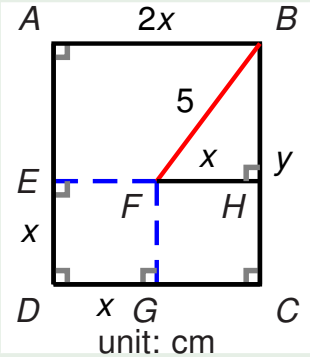

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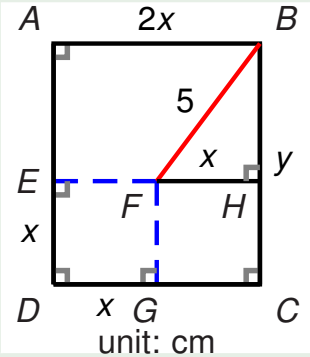

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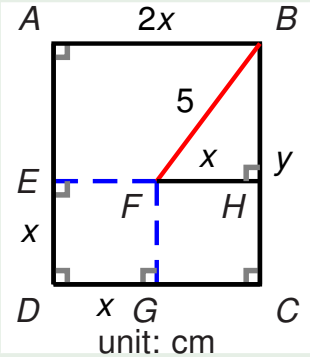

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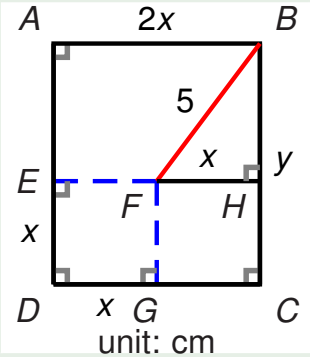
$$x_1, x_2 = \textbf{?}$$

Example



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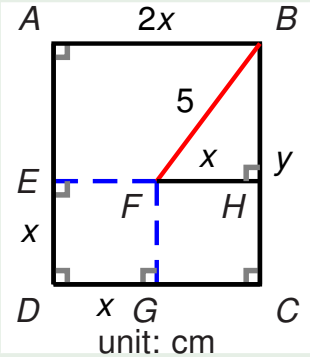

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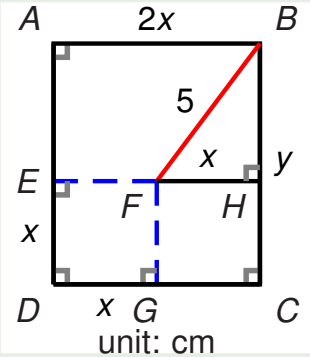

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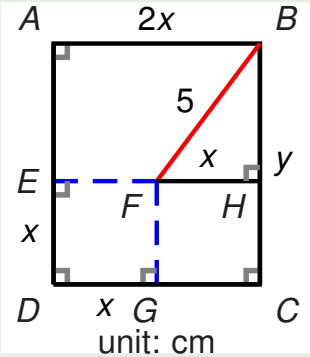

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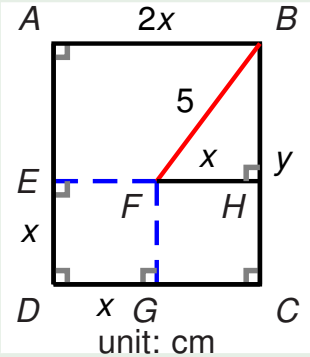

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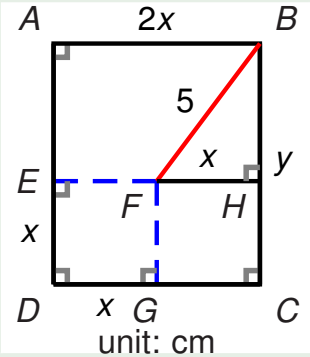
Example



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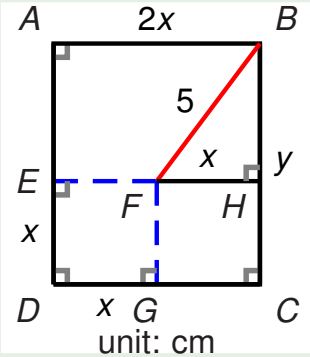

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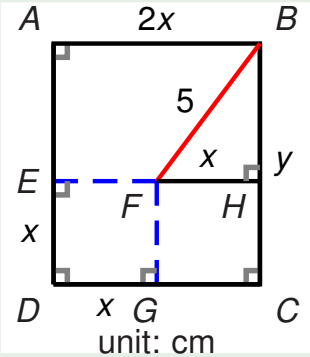

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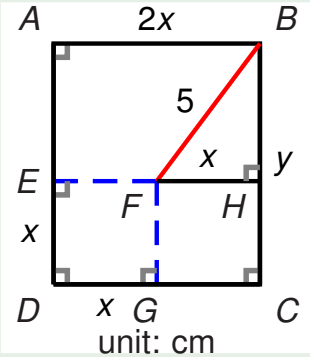

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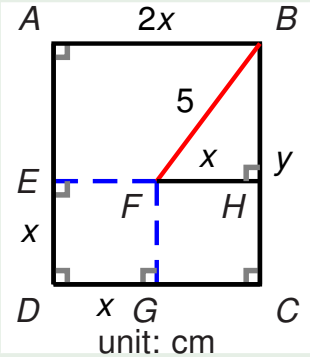

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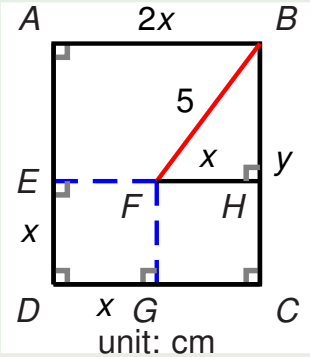

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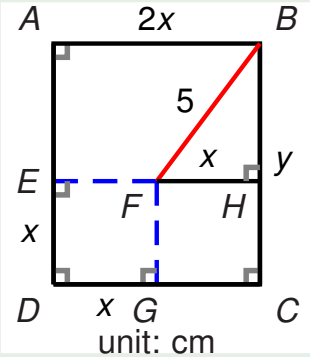

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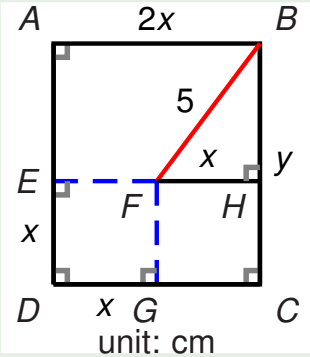
Example



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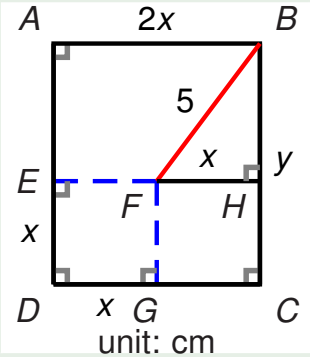
$$\text{Case 1. } x = \frac{39 + 9}{10}$$

Example



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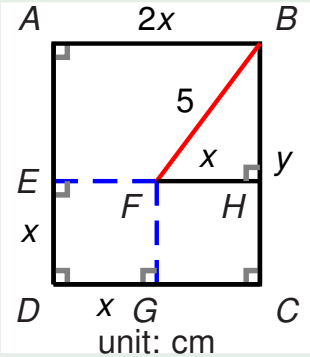
$$\text{Case 1. } x = \frac{39 + 9}{10} = \frac{48}{10}$$

Example



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$$y = 13 - 2x$$

$$5x^2 - 39x + 72 = 0$$

$$x_1, x_2 = \frac{39 \pm 9}{10}$$

$$\text{Case 1. } x = \frac{39 + 9}{10} = \frac{48}{10} = 4.8$$

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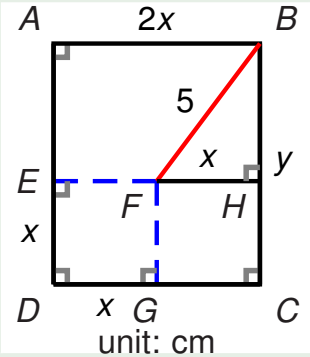

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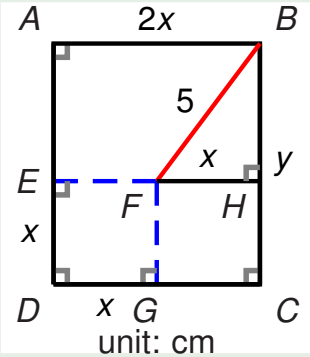

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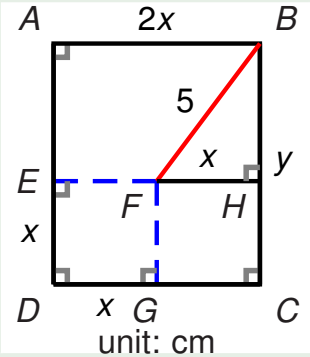

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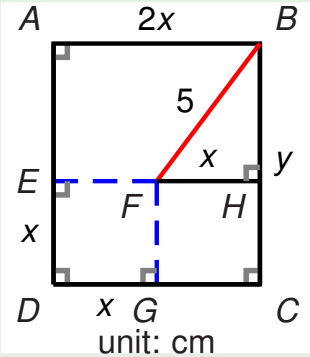
Example



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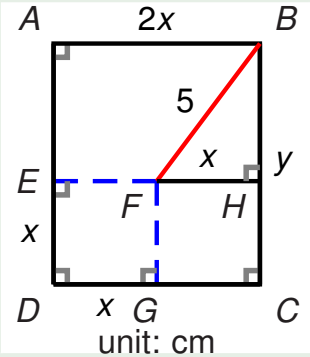
Example



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Solution rejected as problem requires $y > x$.

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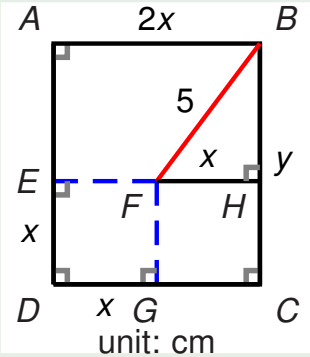

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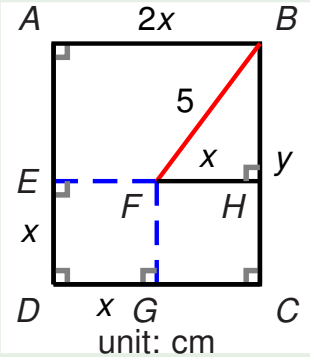

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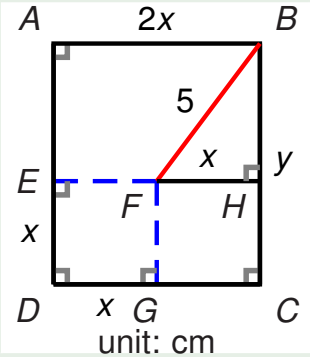

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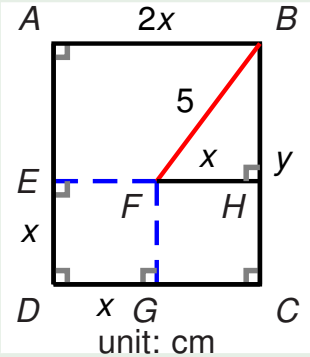
Case 2. $x = \frac{39 - 9}{10} = 3$

Example



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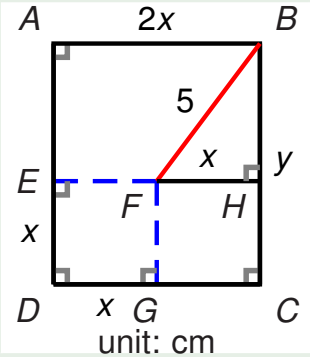
Case 2. $x = \frac{39 - 9}{10} = 3$

$$y = 13 - 2 \cdot x$$

Example



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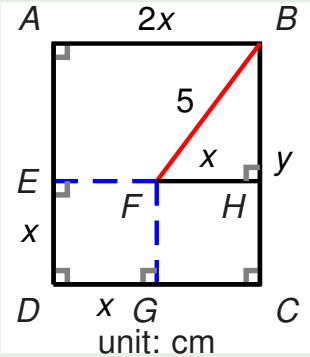

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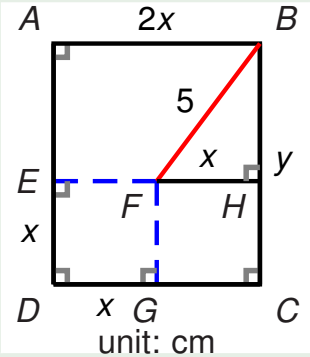
Case 2. $x = \frac{39 - 9}{10} = 3$

$$y = 13 - 2 \cdot x = 13 - 2 \cdot 3 = 7$$

Example



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Solution is valid as $y > x$.