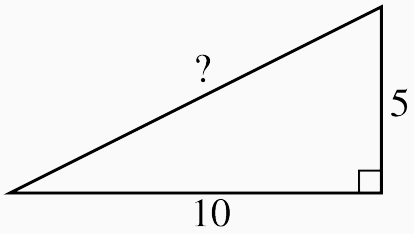
TRIGONOMETRY

The Pythagorean Theorem

Practice Problems

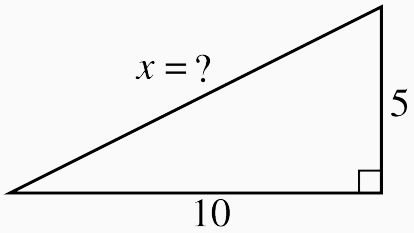
Chipmunk Math

1



Solve for the unknown side.

1



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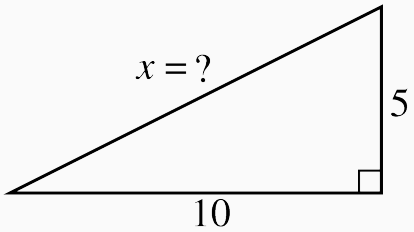
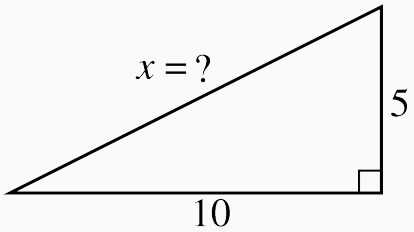


Solve for the unknown side.

Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

1



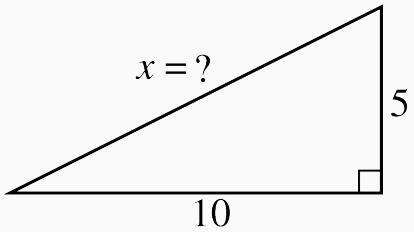
Solve for the unknown side.

Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

$c \Leftrightarrow$ **hypotenuse** (longest side)

1



Solve for the unknown side.

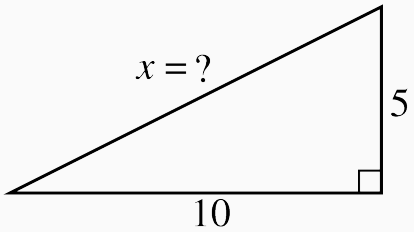
Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

1



Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

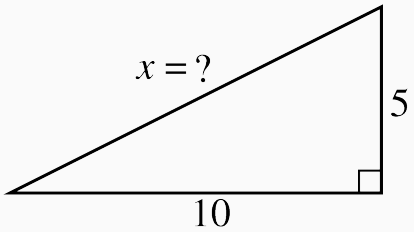
$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

Solve for the unknown side.

$$10^2 + 5^2 = x^2$$

1



Solve for the unknown side.

$$10^2 + 5^2 = x^2$$
$$100 + 25 = x^2$$

Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

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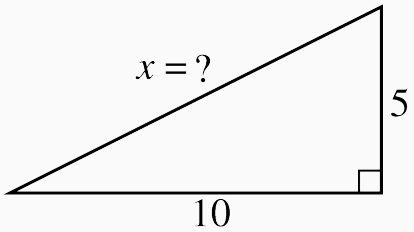


Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

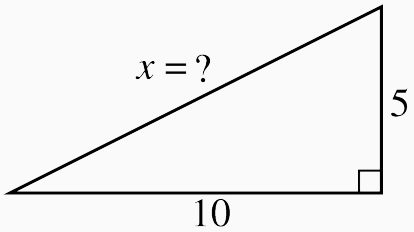
$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

Solve for the unknown side.

$$10^2 + 5^2 = x^2$$
$$100 + 25 = x^2$$
$$125 = x^2$$

1



Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

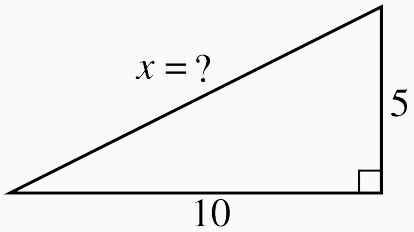
$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

Solve for the unknown side.

$$10^2 + 5^2 = x^2$$
$$100 + 25 = x^2$$
$$125 = x^2$$
$$\sqrt{125} = x$$

1



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$$a^2 + b^2 = c^2$$

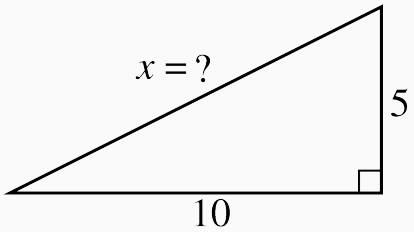
$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

Solve for the unknown side.

$$10^2 + 5^2 = x^2$$
$$100 + 25 = x^2$$
$$125 = x^2$$
$$\sqrt{125} = x$$
$$\sqrt{25 \cdot 5} = x$$

1



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$$a^2 + b^2 = c^2$$

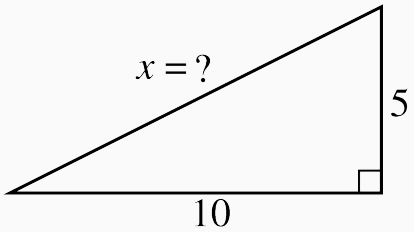
$c \Leftrightarrow$ **hypotenuse** (longest side)

$a, b \Leftrightarrow$ **legs** (shorter sides)

Solve for the unknown side.

$$\begin{aligned} 10^2 + 5^2 &= x^2 \\ 100 + 25 &= x^2 \\ 125 &= x^2 \\ \sqrt{125} &= x \\ \sqrt{25 \cdot 5} &= x \\ 5\sqrt{5} &= x \end{aligned}$$

1



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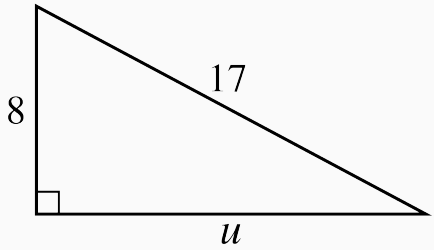
$$100 + 25 = x^2$$
$$125 = x^2$$
$$\sqrt{125} = x$$
$$\sqrt{25 \cdot 5} = x$$
$$5\sqrt{5} = x$$

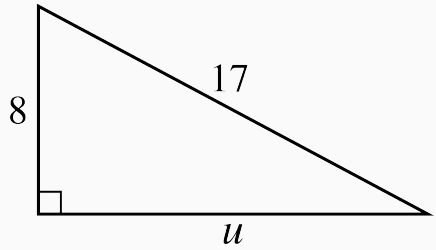
2



Solve for the value of u.

2

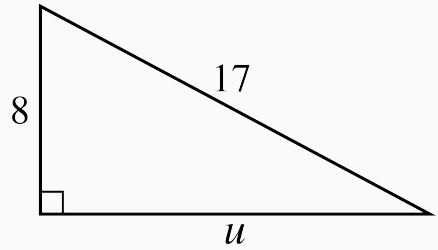
Solve for the value of u.



Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

2



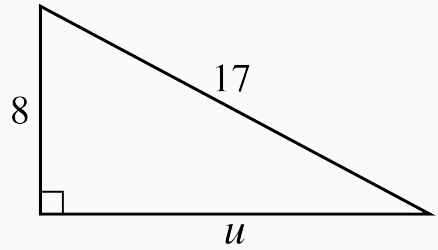
Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$8^2 + u^2 = 17^2$$

2



Right triangle $\Rightarrow$ Pythag. Thm:

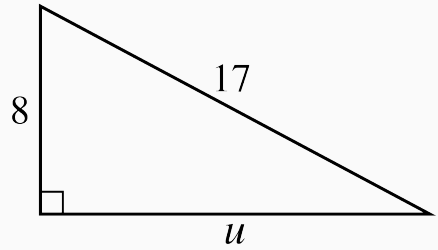
$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$8^2 + u^2 = 17^2$$

$$64 + u^2 = 289$$

2



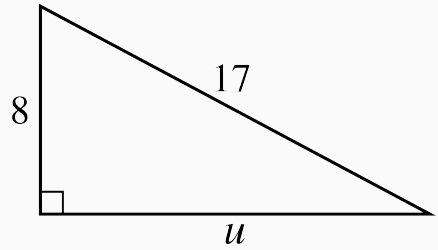
Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$8^2 + u^2 = 17^2$$
$$64 + u^2 = 289$$
$$u^2 = 225$$

2



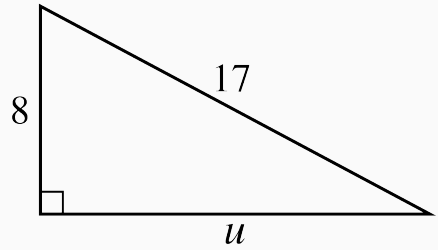
Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$8^2 + u^2 = 17^2$$
$$64 + u^2 = 289$$
$$u^2 = 225$$
$$u = \sqrt{225}$$

2



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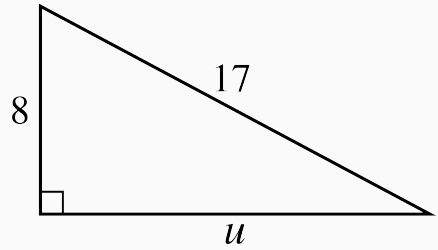
$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$8^2 + u^2 = 17^2$$
$$64 + u^2 = 289$$
$$u^2 = 225$$
$$u = \sqrt{225}$$
$$u = \sqrt{15^2}$$

2



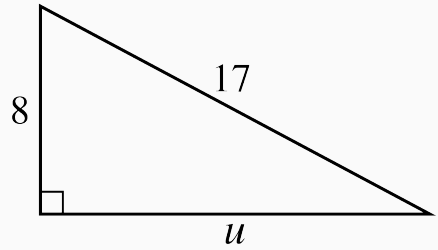
Right triangle $\Rightarrow$ Pythag. Thm:

$$a^2 + b^2 = c^2$$

Solve for the value of u.

$$\begin{aligned} 8^2 + u^2 &= 17^2 \\ 64 + u^2 &= 289 \\ u^2 &= 225 \\ u &= \sqrt{225} \\ u &= \sqrt{15^2} \\ u &= 15 \end{aligned}$$

2



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Solve for the value of u.

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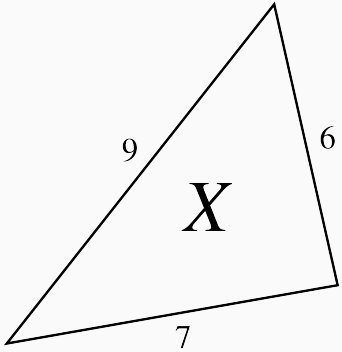
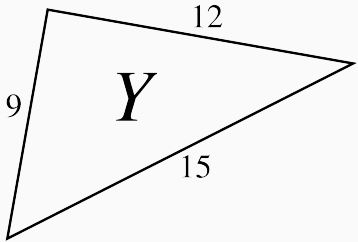
3

Which of the below are right triangles?





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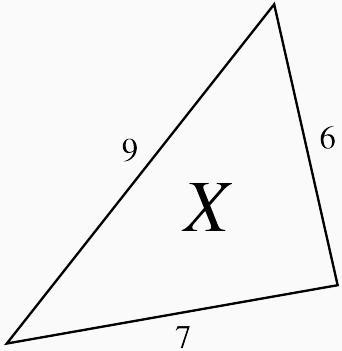
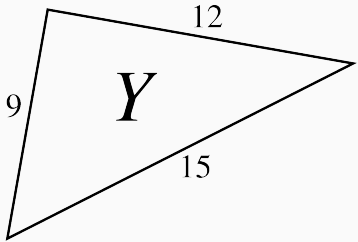
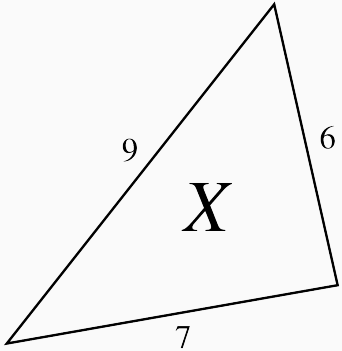


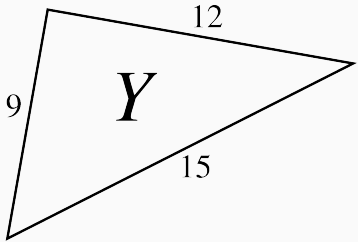


If: $a^2 + b^2 = c^2$; **Then:** Right triangle

3

Which of the below are right triangles?

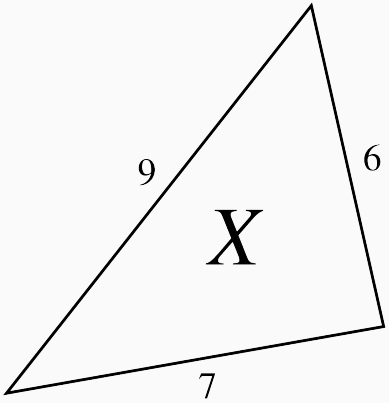




If: $a^2 + b^2 = c^2$; **Then:** Right triangle (where c is longest side)

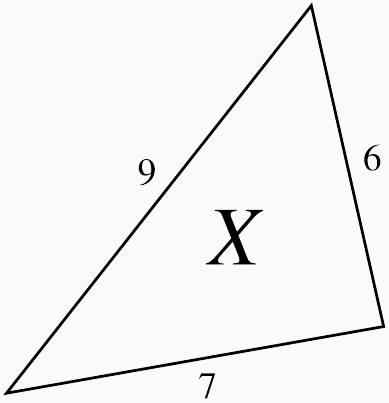
3, CONT.

If: $a^2 + b^2 = c^2$; **Then:** Right triangle



3, CONT.

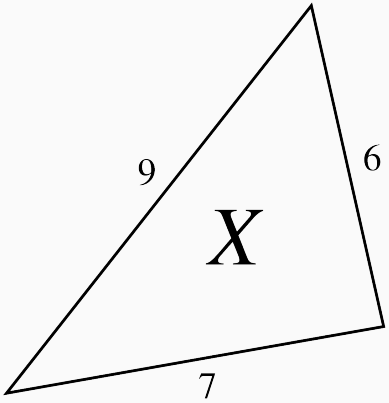
If: $a^2 + b^2 = c^2$; **Then:** Right triangle



$7^2 + 6^2 \stackrel{?}{=} 9^2$

3, CONT.

If: $a^2 + b^2 = c^2$; **Then:** Right triangle

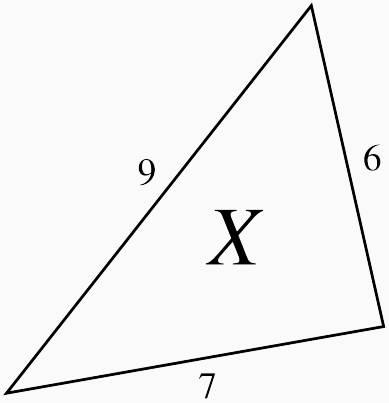


$$7^2 + 6^2 \stackrel{?}{=} 9^2$$

$$49 + 36 \stackrel{?}{=} 81$$

3, CONT.

If: $a^2 + b^2 = c^2$; **Then:** Right triangle



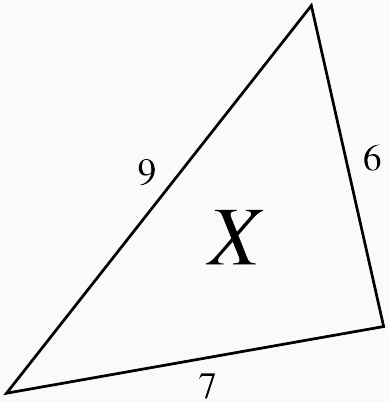
$$7^2 + 6^2 \stackrel{?}{=} 9^2$$

$$49 + 36 \stackrel{?}{=} 81$$

$$85 \neq 81$$

3, CONT.

If: $a^2 + b^2 = c^2$; **Then:** Right triangle



$$7^2 + 6^2 \stackrel{?}{=} 9^2$$

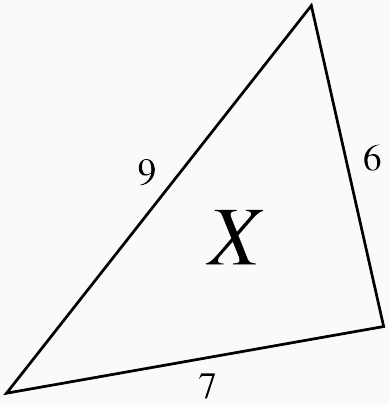
$$49 + 36 \stackrel{?}{=} 81$$

$$85 \neq 81$$

X is **not** a right triangle.

3, CONT.

If: $a^2 + b^2 = c^2$; **Then:** Right triangle



$$7^2 + 6^2 \stackrel{?}{=} 9^2$$

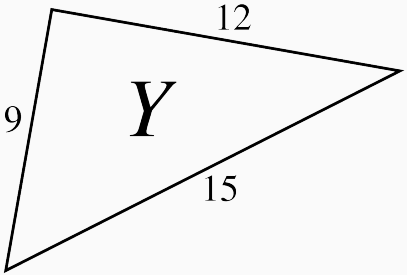
$$49 + 36 \stackrel{?}{=} 81$$

$$85 \neq 81$$

X is **not** a right triangle.

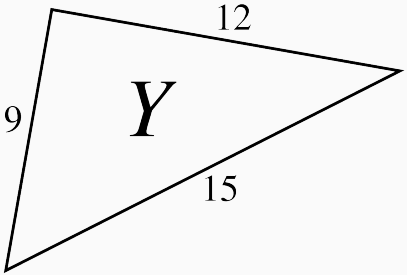
$(85 > 81 \Rightarrow X$ is an ***acute*** triangle.)

3, CONT.



$$a^2 + b^2 \stackrel{?}{=} c^2$$

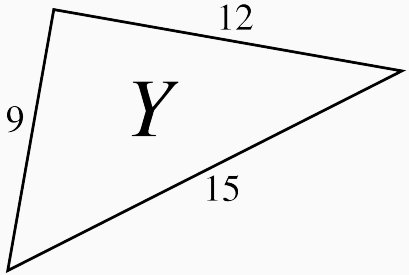
3, CONT.



$$a^2 + b^2 \stackrel{?}{=} c^2$$

$$12^2 + 9^2 \stackrel{?}{=} 15^2$$

3, CONT.

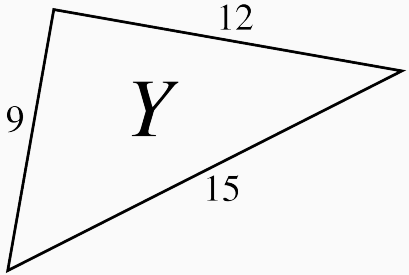


$$a^2 + b^2 \stackrel{?}{=} c^2$$

$$12^2 + 9^2 \stackrel{?}{=} 15^2$$

$$144 + 81 \stackrel{?}{=} 225$$

3, CONT.



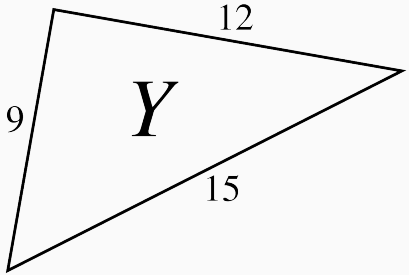
$$a^2 + b^2 \stackrel{?}{=} c^2$$

$$12^2 + 9^2 \stackrel{?}{=} 15^2$$

$$144 + 81 \stackrel{?}{=} 225$$

$$225 = 225$$

3, CONT.



$$a^2 + b^2 \stackrel{?}{=} c^2$$

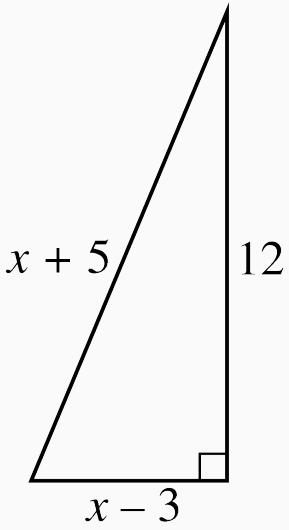
$$12^2 + 9^2 \stackrel{?}{=} 15^2$$

$$144 + 81 \stackrel{?}{=} 225$$

$$225 = 225$$

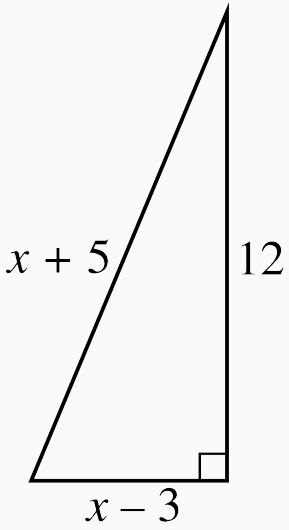
Y **is** a right triangle.

4



Solve for x.

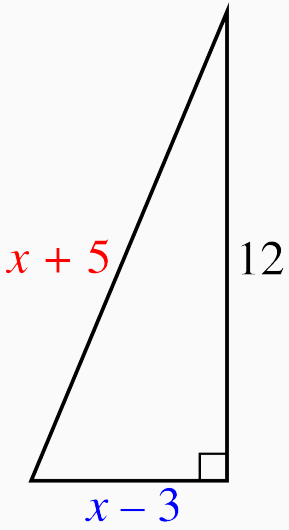
4



Solve for x.

$$a^2 + b^2 = c^2$$

4



Solve for x.

$$a^2 + b^2 = c^2$$

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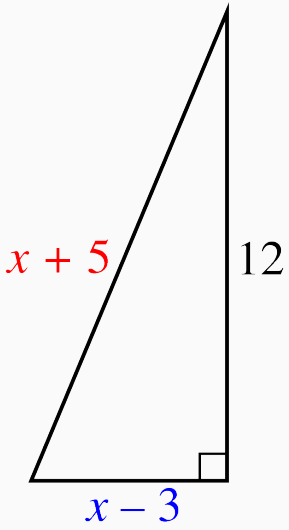
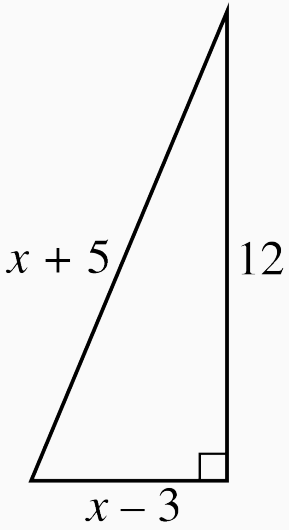


Solve for x.

$$a^2 + b^2 = c^2$$

$$(x-3)^2 + 12^2 = (x+5)^2$$

4



Solve for x.

$$a^2 + b^2 = c^2$$
$$(x-3)^2 + 12^2 = (x+5)^2$$
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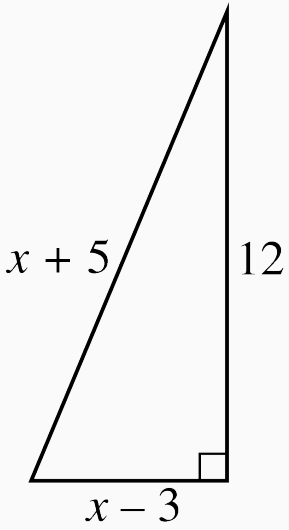
4



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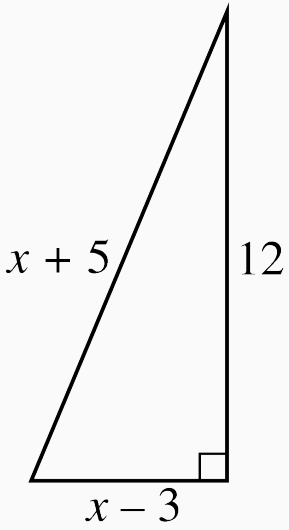
4



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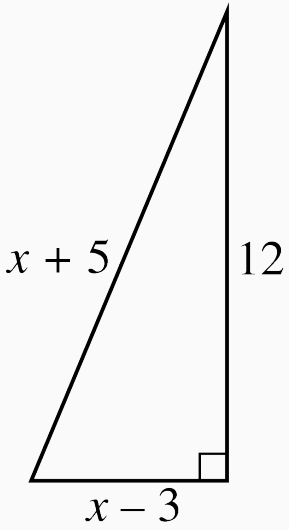

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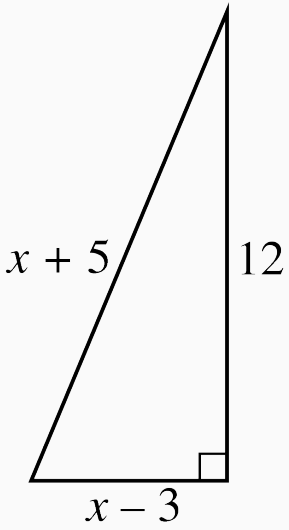

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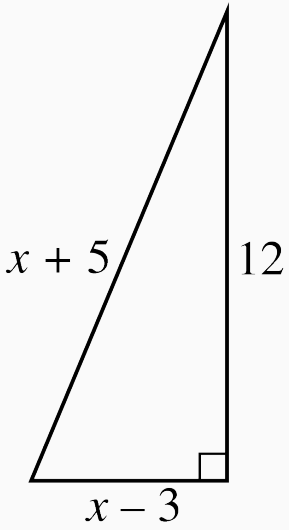

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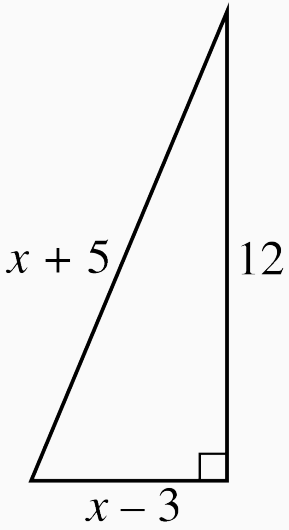

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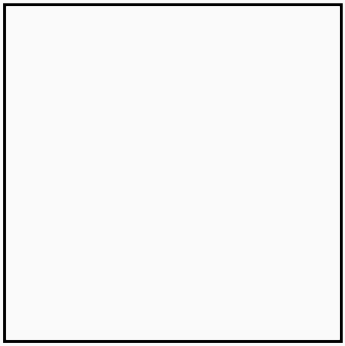
5

How long is the square’s diagonal?



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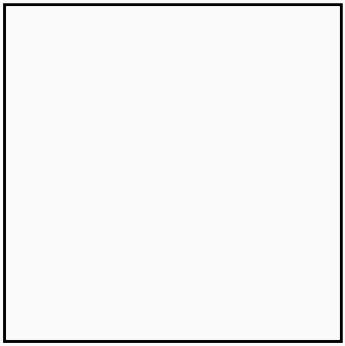

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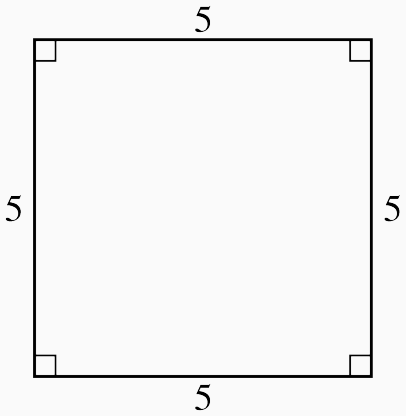

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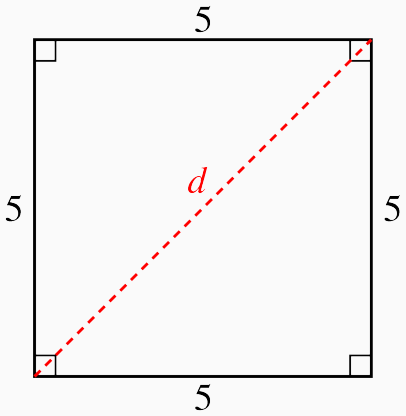

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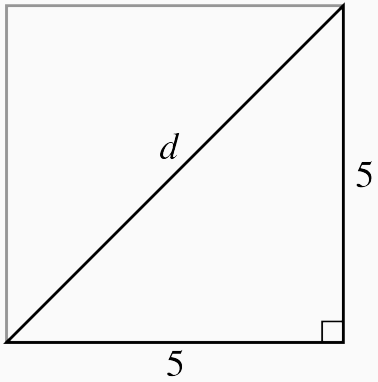

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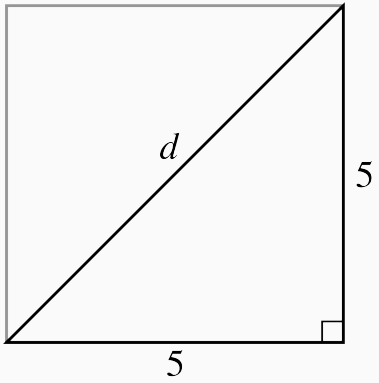

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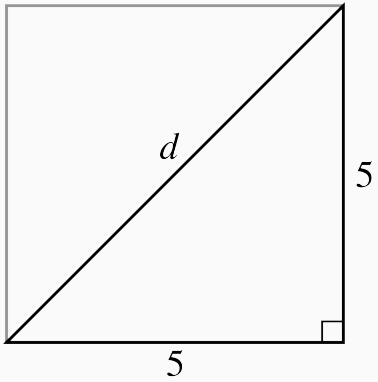

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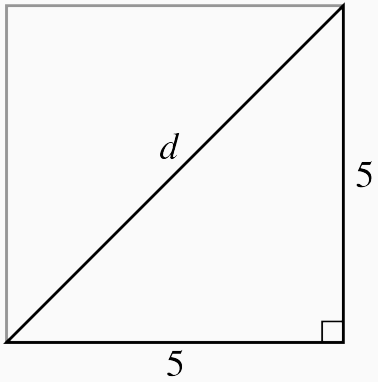
5



How long is the square's diagonal?

$$5^2 + 5^2 = d^2$$
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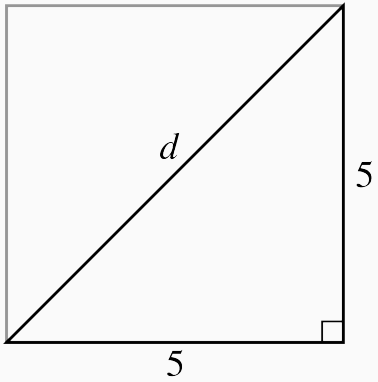

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$$5^2 + 5^2 = d^2$$
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$$\sqrt{50} = d$$

5

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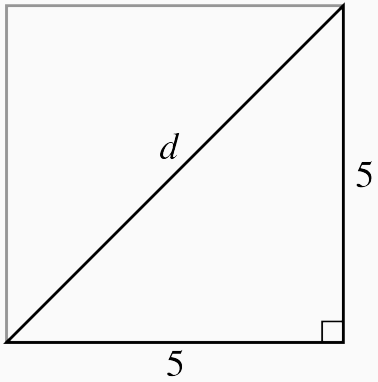

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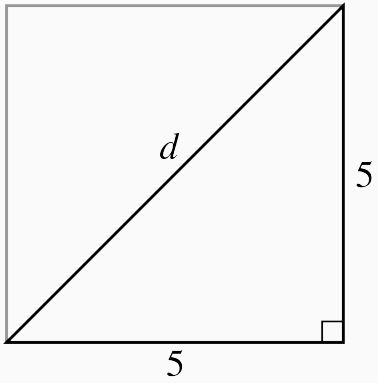

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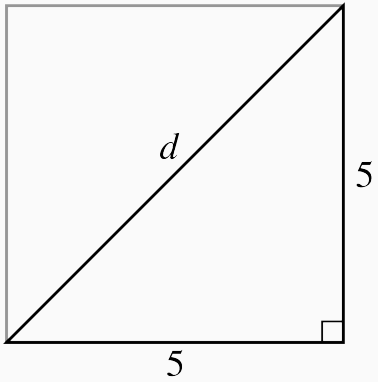

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Tom is painting a building. He has a ladder that's 4m long. To do the painting, the top of the ladder must be at least 3.5m up the wall. What is the farthest that the bottom of the ladder can be from the wall?

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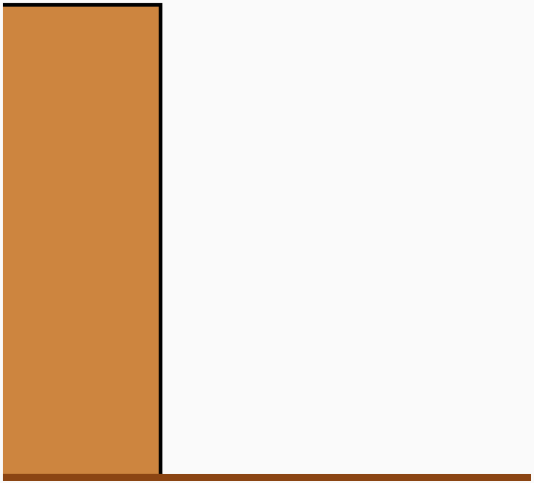

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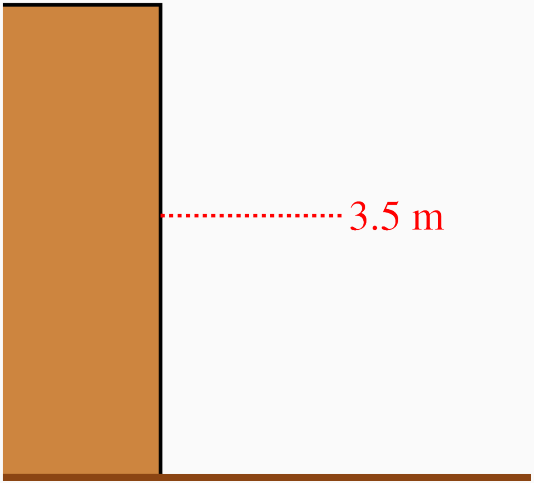

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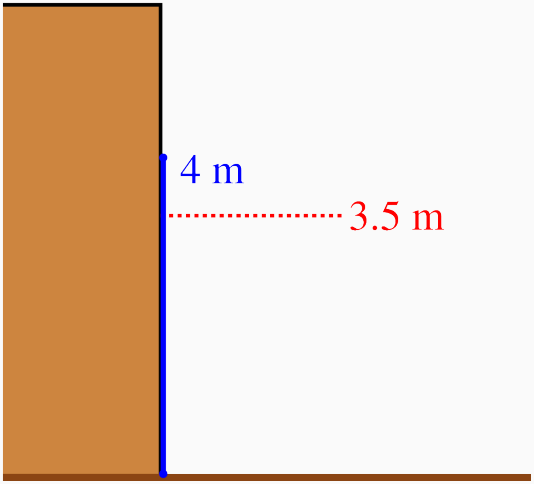

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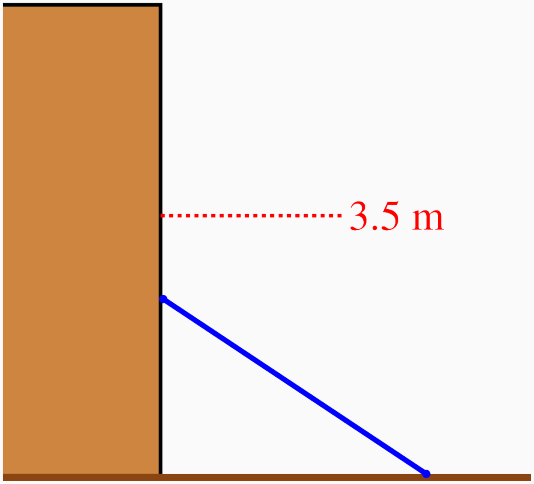

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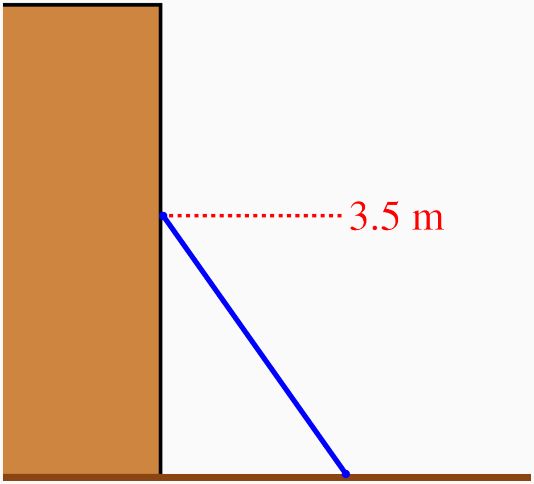
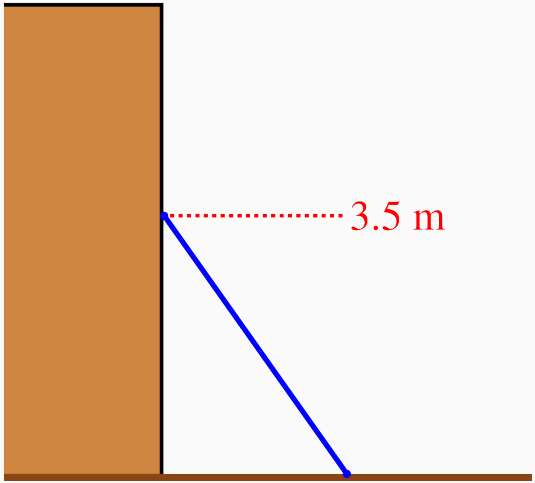


6, CONT.



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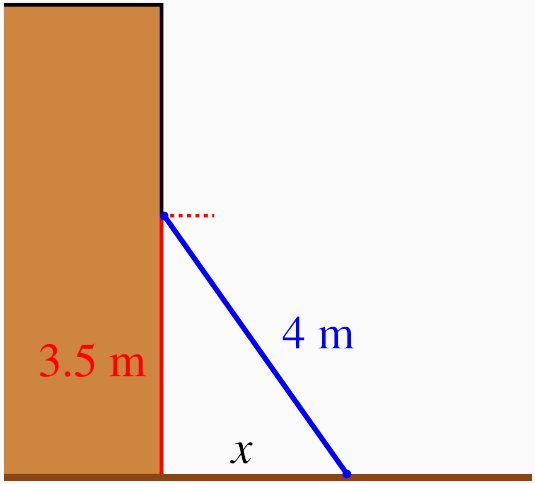

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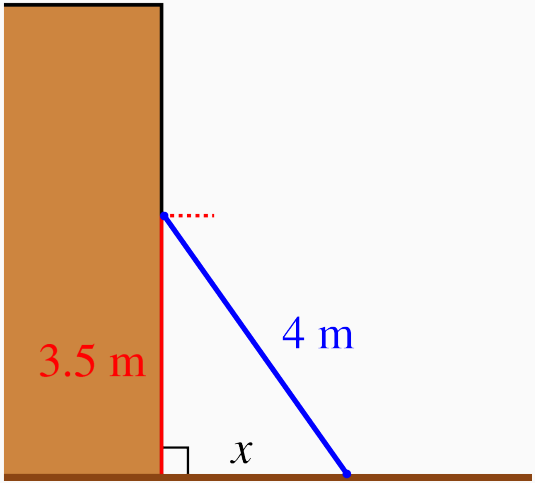

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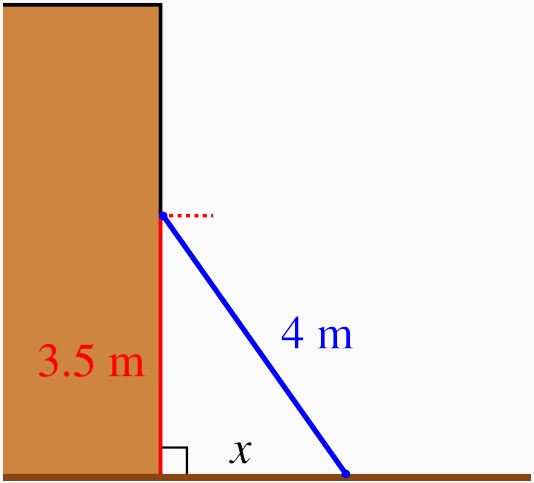
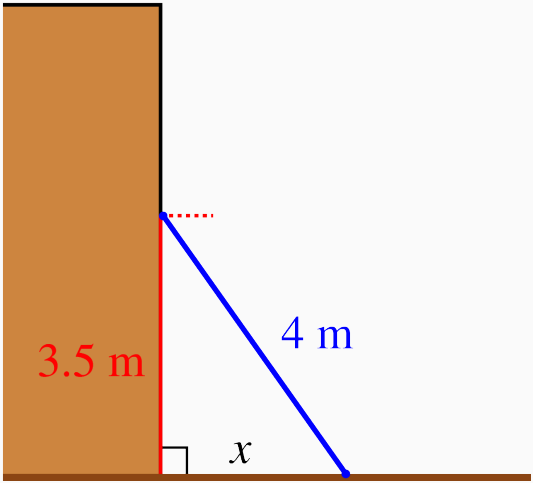


$$3.5^2 + x^2 = 4^2$$

6, CONT.



$$3.5^2 + x^2 = 4^2$$

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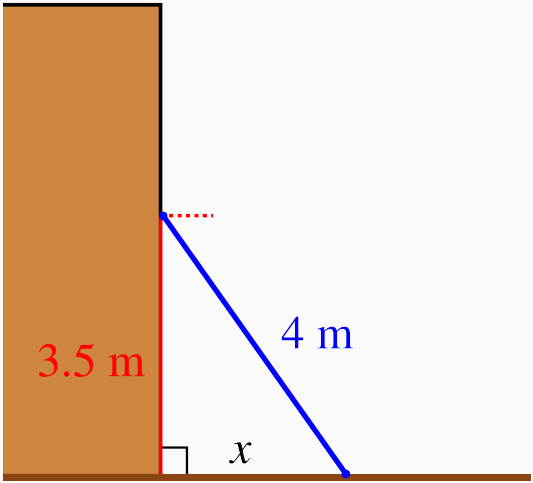
6, CONT.



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$$x^2 = 3.75$$

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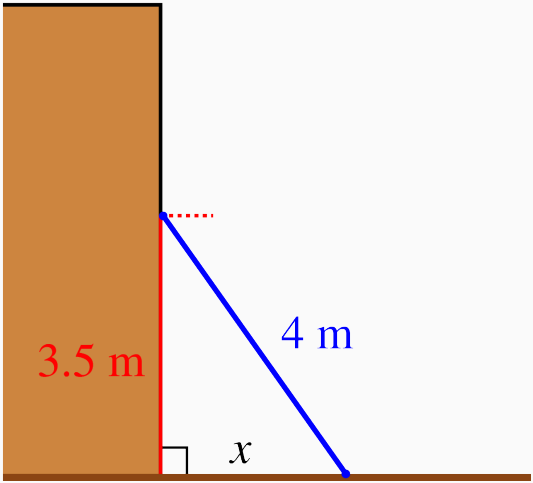

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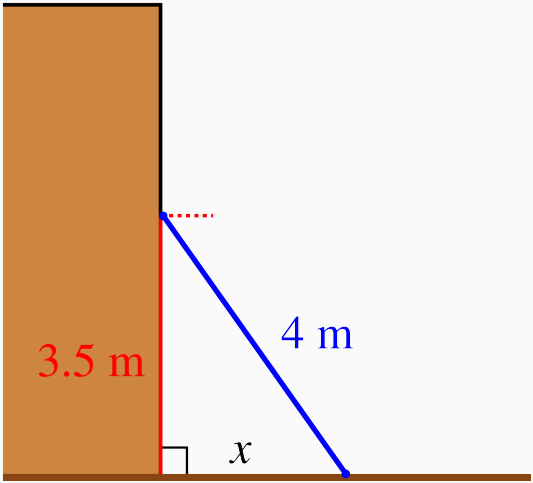
6, CONT.



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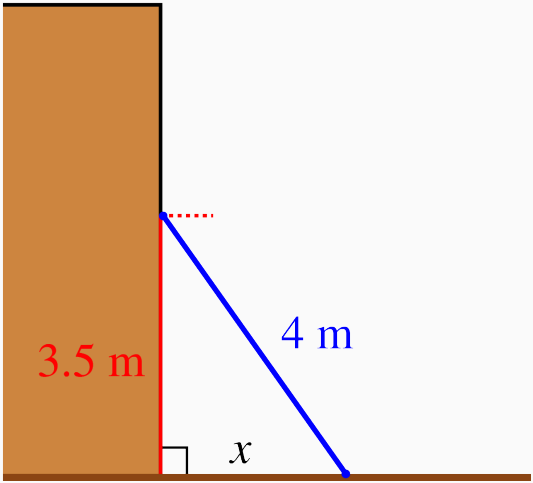
$$x = \sqrt{3.75} \approx 1.93649$$

6, CONT.



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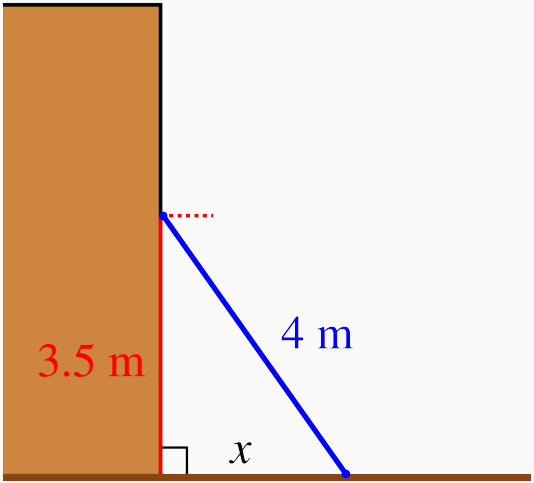
6, CONT.



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Thanks for Watching!

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