

Pythagorean Theorem

PYTHAGOREAN THEOREM

KEY CONCEPT

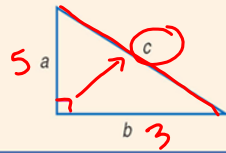
Pythagorean Theorem

Words In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

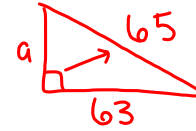
Symbols $c^2 = a^2 + b^2$

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

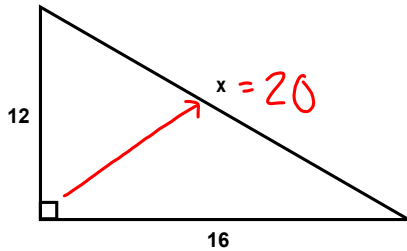
Model



LEG (a)	LEG (b)	HYPOTENUSE (c)
? = 16	63	65

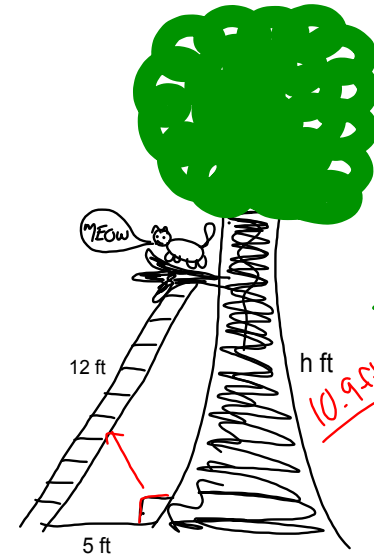


$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 a^2 + 63^2 &= 65^2 \\
 a^2 + 3969 &= 4225 \\
 -3969 & \quad -3969 \\
 \hline
 a^2 &= 256 \\
 a &= 16
 \end{aligned}$$



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 12^2 + 16^2 &= c^2 \\
 144 + 256 &= c^2 \\
 \sqrt{400} &= \sqrt{c^2} \\
 20 &= c
 \end{aligned}$$

Example 3: How far up the tree is the cat?



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 5^2 + b^2 &= 12^2 \\
 25 + b^2 &= 144 \\
 -25 & \quad -25 \\
 \hline
 b^2 &= 119 \\
 b &= 10.9
 \end{aligned}$$