

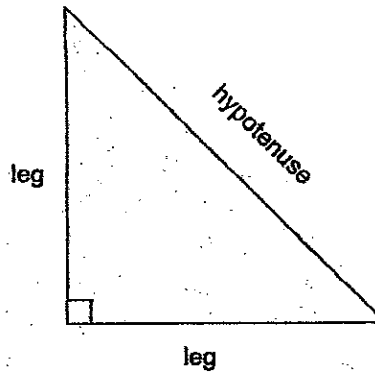
## Activity 42

Legibly write your Student ID number and period number on every page. Do NOT write your name.

Student ID (#####)	Date (MM/DD/YYYY)	Period (#)
000090	03/13/2024	0

### Guided Learning

A right triangle is a triangle that has a right angle. Each side that is touching the right angle is called a **leg**. The side that is not touching the right angle is called the **hypotenuse**.



According to the **Pythagorean Theorem**, the hypotenuse squared is equal to the first leg squared plus the second leg squared.

$5^2 = 4^2 + x^2$ $5^2 = x^2 + 4^2$	$5^2 = x^2 + 3^2$ $5^2 = 3^2 + x^2$	$x^2 = 3^2 + 4^2$ $x^2 = 4^2 + 3^2$

When writing the equation, identify the hypotenuse first! This is what must be alone on the left side of the equation. On the right side of the equation, which leg is first does not matter.

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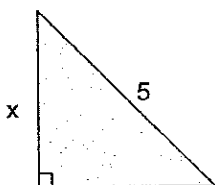
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### Independent Learning

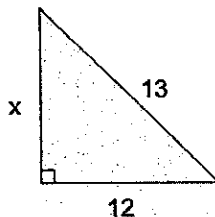
Use the given right triangle to write the correct equation. Then solve for  $x$ .

1



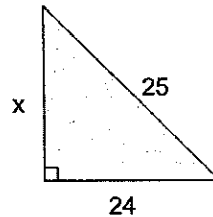
$$\begin{aligned}
 5^2 &= x^2 + 4^2 \\
 25 &= x^2 + 16 \\
 -16 & \quad -16 \\
 \hline
 9 &= x^2 \\
 3 &= |x| \\
 x &= \{-3, 3\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{3\}
 \end{aligned}$$

2



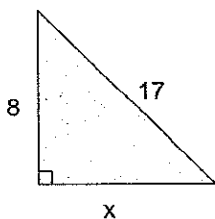
$$\begin{aligned}
 13^2 &= x^2 + 12^2 \\
 169 &= x^2 + 144 \\
 -144 & \quad -144 \\
 \hline
 25 &= x^2 \\
 5 &= |x| \\
 x &= \{-5, 5\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{5\}
 \end{aligned}$$

3



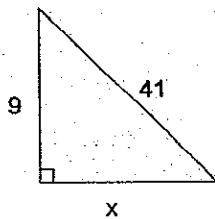
$$\begin{aligned}
 25^2 &= x^2 + 24^2 \\
 625 &= x^2 + 576 \\
 -576 & \quad -576 \\
 \hline
 49 &= x^2 \\
 7 &= |x| \\
 x &= \{-7, 7\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{7\}
 \end{aligned}$$

4



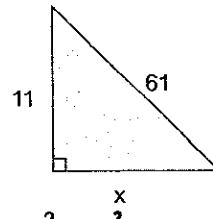
$$\begin{aligned}
 17^2 &= 8^2 + x^2 \\
 289 &= 64 + x^2 \\
 -64 & \quad -64 \\
 \hline
 225 &= x^2 \\
 15 &= |x| \\
 x &= \{-15, 15\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{15\}
 \end{aligned}$$

5



$$\begin{aligned}
 41^2 &= 9^2 + x^2 \\
 1681 &= 81 + x^2 \\
 -81 & \quad -81 \\
 \hline
 1600 &= x^2 \\
 40 &= |x| \\
 x &= \{-40, 40\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{40\}
 \end{aligned}$$

6

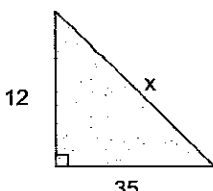
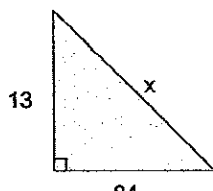
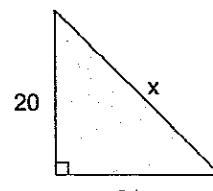
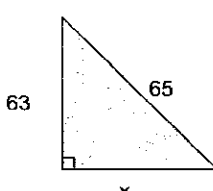
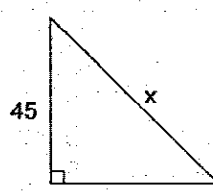
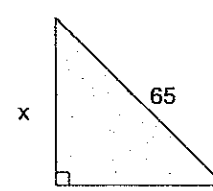


$$\begin{aligned}
 61^2 &= 11^2 + x^2 \\
 3721 &= 121 + x^2 \\
 -121 & \quad -121 \\
 \hline
 3600 &= x^2 \\
 60 &= |x| \\
 x &= \{-60, 60\} \\
 x \in \mathbb{R} \mid x > 0 \\
 \therefore x &= \{60\}
 \end{aligned}$$

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<p><b>7</b></p>  $x^2 = 12^2 + 35^2$ $x^2 = 144 + 1225$ $\sqrt{x^2} = \sqrt{1369}$ $ x  = 37$ $x = \{-37, 37\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{37\}$	<p><b>8</b></p>  $x^2 = 13^2 + 84^2$ $x^2 = 169 + 7056$ $\sqrt{x^2} = \sqrt{7225}$ $ x  = 85$ $x = \{-85, 85\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{85\}$	<p><b>9</b></p>  $x^2 = 20^2 + 21^2$ $x^2 = 400 + 441$ $\sqrt{x^2} = \sqrt{841}$ $ x  = 29$ $x = \{-29, 29\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{29\}$
<p><b>10</b></p>  $65^2 = 63^2 + x^2$ $4225 = 3969 + x^2$ $3969 - 3969 \quad -3969$ $\sqrt{256} = \sqrt{x^2}$ $16 =  x $ $x = \{-16, 16\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{16\}$	<p><b>11</b></p>  $x^2 = 45^2 + 28^2$ $x^2 = 2025 + 784$ $\sqrt{x^2} = \sqrt{2809}$ $ x  = 53$ $x = \{-53, 53\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{53\}$	<p><b>12</b></p>  $65^2 = x^2 + 33^2$ $4225 = x^2 + 1089$ $-1089 \quad -1089$ $\sqrt{3136} = \sqrt{x^2}$ $56 =  x $ $x = \{-56, 56\}$ $x \in \mathbb{R} \mid x > 0$ $\therefore x = \{56\}$

**THIS IS THE END OF THE ACTIVITY**