

(4)



$$x^2 = 11^2 + 4^2$$

$$x^2 = 121 + 16$$

$$x^2 = 137$$

$$x = \sqrt{137}$$

(11)

$b = 4$ $c = 15$

Missing Side?

↑
hypotenuse

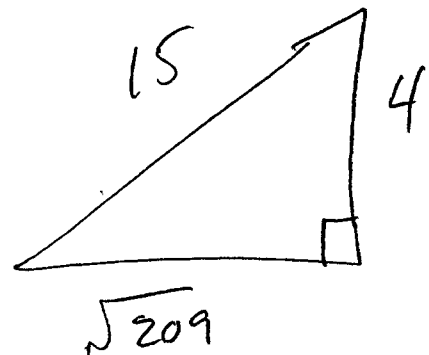
$$15^2 = 4^2 + a^2$$

$$225 = 16 + a^2$$

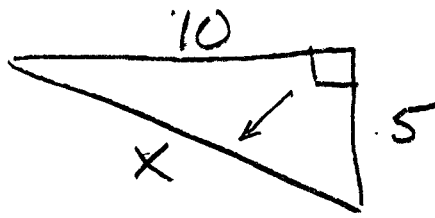
$$\begin{array}{r} -16 \end{array}$$

$$209 = a^2$$

$$\sqrt{209} = a$$



⑤



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

$$x^2 = 25 + 100$$

$$x^2 = 125$$

$$x = \sqrt{125}$$

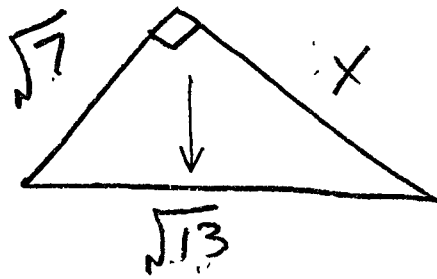
$$x = (\sqrt{25})\sqrt{5}$$

$$x = 5\sqrt{5}$$

$$\sqrt{25} = 5$$



⑥

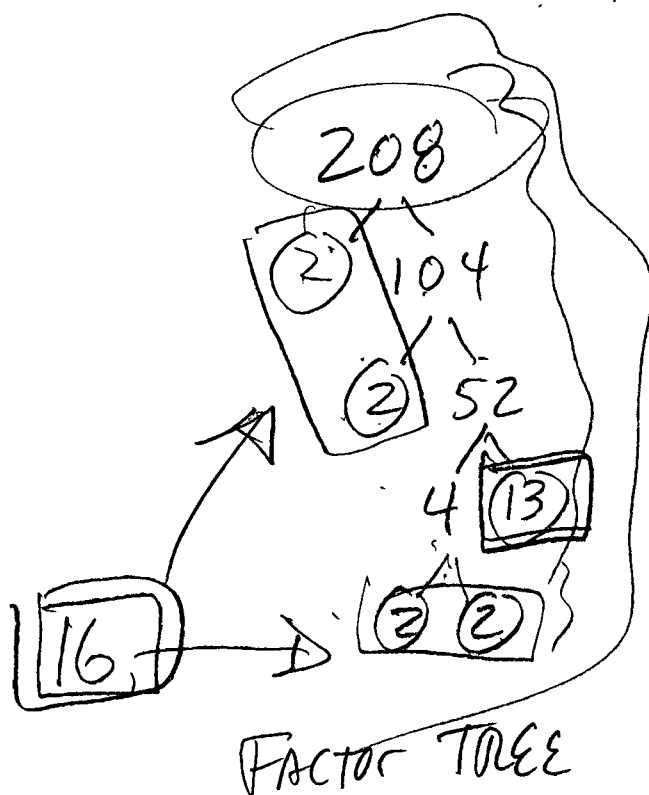
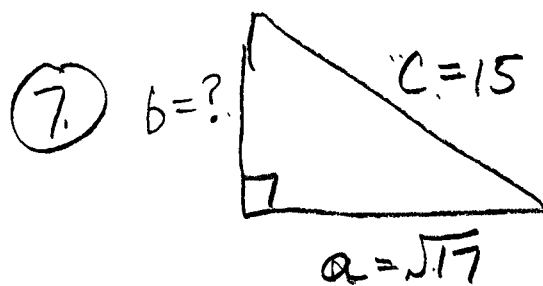
Find x

$$(\sqrt{13})^2 = (\sqrt{7})^2 + x^2$$

$$13 = 7 + x^2$$

$$6 = x^2$$

$$\boxed{\sqrt{6} = x}$$



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

$$15^2 = b^2 + (\sqrt{17})^2$$

$$225 = b^2 + 17$$

$$-17 \quad -17$$

$$208 = b^2$$

$$\sqrt{208} = b$$

$$\sqrt{16} \sqrt{13} = b$$

$$4\sqrt{13} = b$$

ONE
STEP

$$\sqrt{4} \sqrt{52} = b$$

$$2\sqrt{52} = b$$

$$2\sqrt{4} \sqrt{13} = b$$

$$4\sqrt{13} = b$$

TWO
STEPS

↑ ↑

BOTH WAYS
ARE OK AS
LONG AS YOU
END UP
WITH $4\sqrt{13}$

①7. $a = 7$; $c = 9$ Find missing side

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

$$b = ?$$

$$7^2 + b^2 = 9^2$$

$$\begin{array}{r} 49 + b^2 = 81 \\ -49 \quad -49 \end{array}$$

$$b^2 = 32$$

$$b = \sqrt{32}$$

$$b = \sqrt{16} \sqrt{2}$$

$$\boxed{b = 4\sqrt{2}}$$

$$\begin{array}{l} \sqrt{32} \\ \sqrt{4} \sqrt{8} \\ 2\sqrt{8} \\ \sqrt{4} \sqrt{2} \\ 4\sqrt{2} \end{array}$$

$$\begin{array}{c} 32 \\ \swarrow \searrow \\ 4 \quad 8 \\ \swarrow \searrow \quad \swarrow \searrow \\ (\textcircled{2}) (\textcircled{2}) \quad (\textcircled{2}) 4 \\ \quad \quad \quad \swarrow \searrow \\ \quad \quad \quad (\textcircled{2}) (\textcircled{2}) \end{array}$$

(23)

$$a = 5, c = 9$$

↑
hypotenuse

$$9^2 = 5^2 + b^2$$

$$81 = 25 + b^2$$

$$\begin{array}{r} -25 \quad -25 \\ \hline \end{array}$$

$$56 = b^2$$

$$\sqrt{56} = b$$

$$\sqrt{4} \sqrt{14} = b$$

$$\boxed{2\sqrt{14} = b}$$

(31) 9, 12, 16
 ↑

$$9^2 + 12^2 \stackrel{?}{=} 16^2$$

$$81 + 144 = 256$$

NOT RIGHT Δ

225 $\neq$ 256

225 < 256 OBTUSE

④⑨ $\sqrt{65}, 12, \sqrt{209}$

$$(\sqrt{65})^2 + 12^2 \stackrel{?}{=} (\sqrt{209})^2$$

$$65 + 144 = 209 \checkmark$$

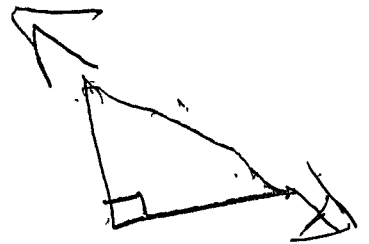
⑤② $6, 5, \sqrt{85}$

$$6^2 + 5^2 \stackrel{?}{=} (\sqrt{85})^2$$

$$36 + 25 = 85$$

$$61 = 85 \quad \text{NOT } \perp$$

OBTUSE



(60)

5, 12, 15
↑
c

Right, obtuse, or Acute

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

hypotenuse

$$5^2 + 12^2 = 15^2$$

$$25 + 144 = 225$$

$$169 \neq 225$$

(68)

4√11, 10, 15

√11, √16

√176

↑

$$(\sqrt{176})^2 + 10^2 \stackrel{?}{=} 15^2$$

$$176 + 100 = 225$$

=

$$276 \neq 225$$

ACUTE

(57) 5, 12, 13

$$13^2 \stackrel{?}{=} 5^2 + 12^2$$

$$169 = 25 + 144$$

$$169 = 169 \checkmark \quad \text{Right } \checkmark$$

(66) 3, $\sqrt{6}$, $\sqrt{19}$

$$(\sqrt{19})^2 \stackrel{?}{=} 3^2 + (\sqrt{6})^2$$

$$19 \stackrel{?}{=} 9 + 6$$

$$19 \neq 15 \quad \text{obtuse}$$