

Geometry TUESDAY 11-13-12 Class Notes

① 2 km, 12 km, 13 km

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

$$4 + 144 \stackrel{?}{=} 169$$

$$148 \stackrel{?}{=} 169 \therefore \boxed{\text{OBTUSE}}$$

$$148 < 169$$



⑤ 12 ft, $\sqrt{31}$ ft, $\sqrt{170}$ ft

$$12^2 + (\sqrt{31})^2 \stackrel{?}{=} (\sqrt{170})^2$$

$$144 + 31 = 170$$

$$175 > 170 \therefore \boxed{\text{ACUTE}}$$

$\underbrace{\hspace{1cm}}_{c^2}$

②x $\left(\frac{1}{2}\right), \frac{2}{3}, \left(\frac{1}{8}\right)$

$$\boxed{\frac{12}{24}, \left(\frac{16}{24}\right), \frac{3}{24}}$$

c^2
 $\searrow$

$$\frac{4}{9} \stackrel{?}{=} \frac{17}{64}$$

$$\frac{256}{9 \cdot 64} \stackrel{?}{=} \frac{153}{9 \cdot 64} \therefore \boxed{\text{OBTUSE}}$$

$$\left(\frac{2}{3}\right)^2 \stackrel{?}{=} \left(\frac{1}{2}\right)^2 + \left(\frac{1}{8}\right)^2$$

$$\frac{4}{9} \stackrel{?}{=} \frac{1}{4} + \frac{1}{64}$$

$$\frac{4}{9} \stackrel{?}{=} \frac{16}{64} + \frac{1}{64}$$

② 10 mi, 12 mi, 13 mi.

↑

$$10^2 + 12^2 \stackrel{?}{=} 13^2$$

$$100 + 144 \stackrel{?}{=} 169$$

$$244 \stackrel{?}{=} 169 \therefore \boxed{\text{ACUTE}}$$

↑
C²

③ 7 in, $2\sqrt{30}$ in, 13 in

$\sqrt{120}$

4 30

$$13^2 = 7^2 + (\sqrt{120})^2$$

$$169 = 49 + 120$$

$$169 = 169 \therefore \boxed{\text{right}}$$

③ 9 km, 12 km, 17 km

$$17^2 \stackrel{?}{=} 9^2 + 12^2$$

$$289 \stackrel{?}{=} 81 + 144$$

$$289 > 225 \therefore \boxed{\text{obtuse}}$$

④ 2 km, $\sqrt{133}$ km, 13000 m
 " 13 km

$$13^2 \stackrel{?}{=} 2^2 + (\sqrt{133})^2$$

$$169 = 4 + 133$$

$$169 > 137 \therefore \boxed{\text{obtuse}}$$

⑨ $9m, 6m, \underbrace{9\sqrt{2}}_{\substack{|| \\ \sqrt{162}}}m \quad \sqrt{2}\sqrt{81}$

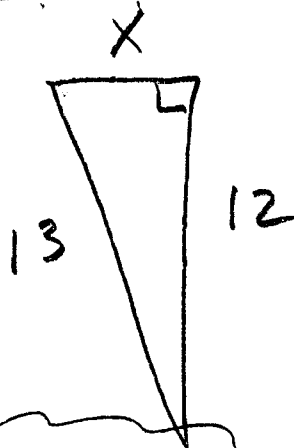
$$\begin{aligned} (9\sqrt{2})^2 &= 9\sqrt{2} \cdot 9\sqrt{2} \\ 9 \cdot 9 \cdot \sqrt{2} \cdot \sqrt{2} \\ \sqrt{\quad} \quad \sqrt{\quad} \\ 81 \cdot 2 \\ 162 \end{aligned}$$

$$(9\sqrt{2})^2 \stackrel{?}{=} 9^2 + 6^2$$

$$162 \stackrel{?}{=} 81 + 36$$

$$162 \stackrel{?}{=} 117 \quad \therefore \boxed{\text{obtuse}}$$

⑭



$$13^2 = x^2 + 12^2$$

$$\begin{array}{r} 169 = \underbrace{x^2}_{\downarrow} + 144 \\ -144 \qquad -144 \end{array}$$

$$25 = x^2$$

$$\sqrt{25} = \sqrt{x^2}$$

$$\boxed{5 = x}$$

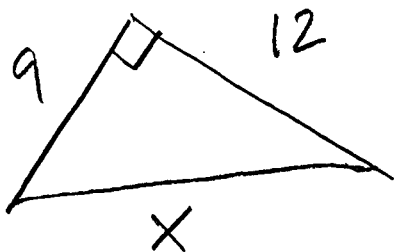
Pythagorean
Triples:

$\boxed{3, 4, 5}$

$\boxed{5, 12, 13}$

$\boxed{8, 15, 17}$

(13)



$$X^2 = 9^2 + 12^2$$

$$X^2 = 81 + 144$$

$$X^2 = 225$$

$$\sqrt{X^2} = \sqrt{225}$$

$$X = 15$$

$$* 6, 8, 10$$

$$9, 12, 15$$

$$* \boxed{3, 4, 5}$$

$$* \boxed{5, 12, 13}$$

$$* \boxed{8, 15, 17}$$

(15)

$$b = 8, c = 10$$

$$\boxed{a = 6}$$

(21)

$$a = 8, b = 9$$

$$\boxed{c = \sqrt{145}}$$

$$8^2 + 9^2 = c^2$$

$$64 + 81 = c^2$$

$$145 = c^2$$

$$\boxed{5} \boxed{29}$$

$$(20) \quad a = \sqrt{37}, \quad b = 6$$

$$(\sqrt{37})^2 + 6^2 = c^2$$

$$37 + 36 = c^2$$

$$73 = c^2$$

$$c = \sqrt{73}$$

(24) $a = 5\sqrt{2}$ $c = 13$ $b = ?$

$$13^2 = (5\sqrt{2})^2 + b^2$$

$$169 = 25 \cdot 2 + b^2$$

$$169 = 50 + b^2$$

$$-50 \quad -50$$

$$119 = b^2$$

$$\boxed{\sqrt{119} = b}$$

$$\left\{ \begin{array}{l} 119 \\ \sqrt{119} \\ \textcircled{7} \textcircled{17} \end{array} \right.$$

Simplify Radicals

- No perfect square factors
- No $\sqrt{\quad}$ in denominator of fraction (bottom)

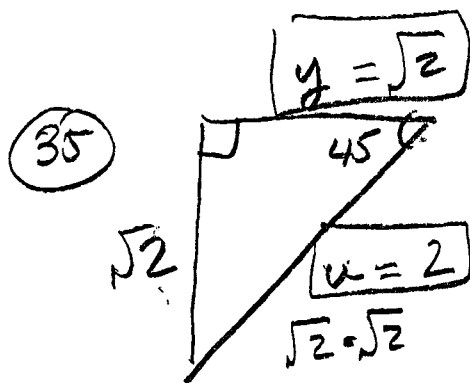
(Ex) $\sqrt{50} = \sqrt{25 \cdot 2} = \sqrt{25} \sqrt{2}$

$$\boxed{5\sqrt{2}}$$

Diagram showing prime factorization of 50: $2 \cdot 5 \cdot 5$. The 5s are circled together, and a line connects them to the 5 in the final simplified radical.

$$\sqrt{51} = \boxed{\sqrt{51}}$$

$$e = 2.7182818284...$$



$$2^2 = (\sqrt{2})^2 + (\sqrt{2})^2$$

$$4 = 2 + 2 \quad \checkmark$$

$$(a+b)^2 = (a+b)(a+b)$$

$$a^2 + ab + ab + b^2$$

$$a^2 + 2ab + b^2$$

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

$$(3+4)^2 = (7)^2$$

$$9 + 16 = 25$$

(20) $a = \sqrt{37}$, $b = 6$ $c = ?$

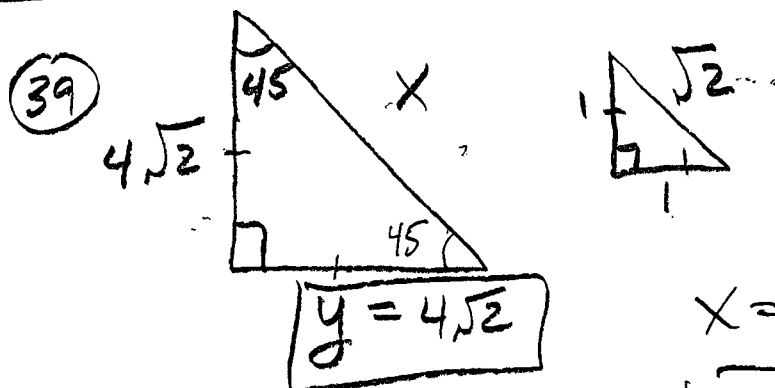
$$c^2 = (\sqrt{37})^2 + 6^2$$

$$c^2 = 37 + 36$$

$$c^2 = 73$$

$$\sqrt{c^2} = \sqrt{73}$$

$$c = \sqrt{73}$$

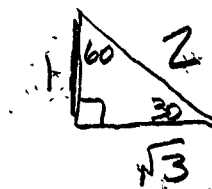
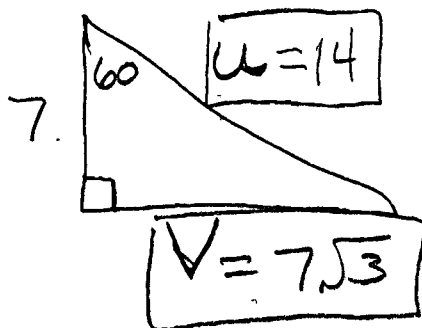


$$y = 4\sqrt{2}$$

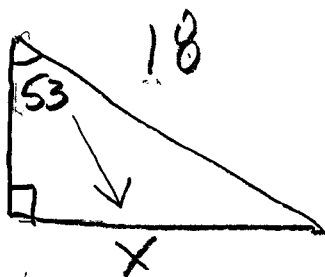
$$x = (4\sqrt{2})\sqrt{2}$$

$$x = 8$$

(46)



(73)

Find X to nearest tenth~~SOH CAH TOA~~

$$18 \cdot \sin 53 = \frac{X}{18} \cdot 18$$

$$18 (0.7986) = X$$

$$\begin{array}{r} 0.7986 \\ \times 18 \\ \hline 16.3888 \\ 7986 \\ \hline 14.3748 \end{array}$$

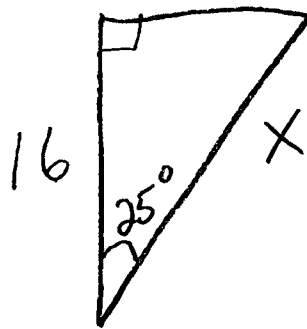
$$X = 14.4$$

⑨② $\tan W = .2309$ $W = ?$

$$\tan^{-1}(.2309) = \boxed{13}^{\circ}$$

⑨④ $\sin W = .3420 = \boxed{20}^{\circ}$

⑧⑥



$$\cancel{X} \cos 25 = \frac{16}{\cancel{X}}$$

$$\frac{\cancel{X} \cos 25}{\cos 25} = \frac{16}{\cos 25}$$

$$X = \frac{16}{.9063}$$

$$X = 17.654$$

$$\boxed{X = 17.7}$$