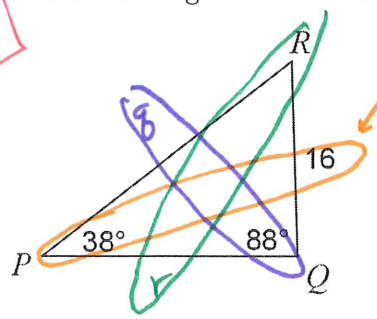
SRT-C8b — Practice Assessment Q3 #3

"little" Aka, Q — "whole number"

1. Find the length of $\overline{PR}$ to the nearest integer.



26

Since pair is complete... Law of Sines!

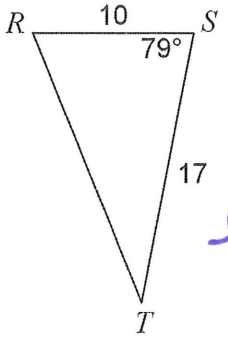
$\frac{\sin 38}{16} = \frac{\sin 88}{8} = \frac{\sin R}{r}$

$8 \cdot \sin 38 = 16 \cdot \sin 88$

$\div \sin 38 \quad \div \sin 38$

$8 = \frac{16 \sin 88}{\sin 38} \rightarrow 25.97 \rightarrow 26$

2. Find the measure of $\angle T$ to the nearest degree.

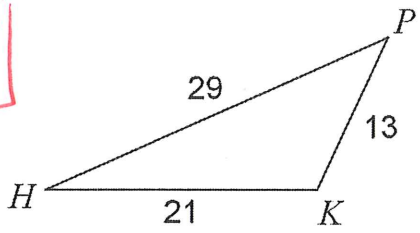


33°

See Pg 2

3. Find the measure of $\angle P$ to the nearest degree.

41°



See Pg 3

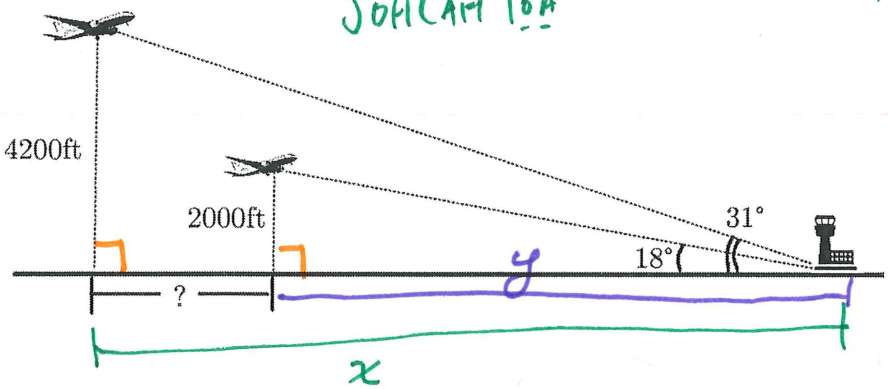
SRT-C8a

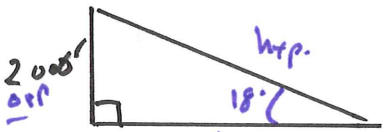
4. Air traffic control has a faulty radar and cannot locate aircraft. From the ground, a person measures the angle of elevation up to two incoming aircraft as 18° and 31° as shown below. Each plane sends its altitude in by radio as 2000ft and 4200ft. In terms of their ground distance, how far apart are the planes from each other to the nearest foot? Show the calculations that lead to your answer.

835ft.

SohCahToa

Plan: find both ground distances, subtract to find answer



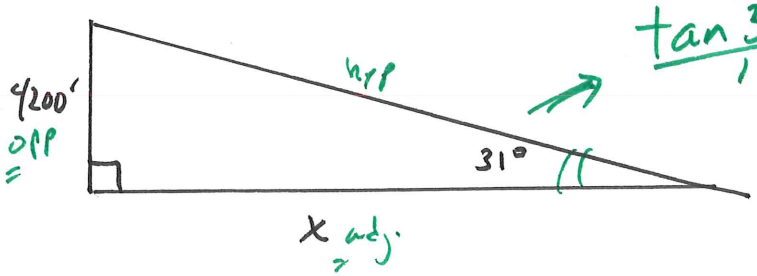


$\tan 18 = \frac{2000'}{y}$

$y \cdot \tan 18 = 2000$

$y = \frac{2000}{\tan 18}$

$y \approx 6155$



$\tan 31 = \frac{4200}{x}$

$4200 = x \cdot \tan 31$

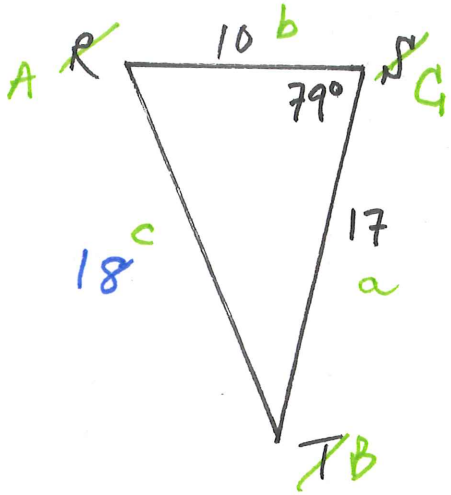
$\frac{4200}{\tan 31} = x$

$6990' \approx x$

Difference?

835ft

2. Find the measure of $\angle T$ to the nearest degree.



No pair of Angle and opposite side!
Law of Cosines it is.

Memorize:

$$c^2 = b^2 + a^2 - 2ab\cdot\cos C$$

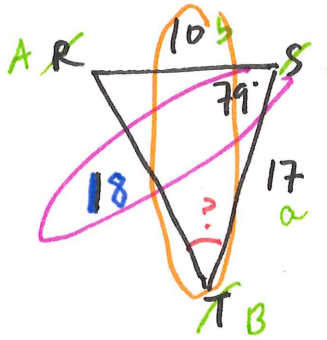
only one Angle known...
should make that C!

$$c^2 = 10^2 + 17^2 - 2\cdot 17\cdot 10\cdot\cos 79^\circ$$

$$c^2 = 324.125$$

$$c = \sqrt{324.125} \approx 18$$

updated picture



Hey! Now I have a complete pair?
Law of Sines.

$$\frac{\sin 79}{18} = \frac{\sin T}{10}$$

$$10\sin 79 = 18\cdot\sin T$$

$$\frac{10\sin 79}{18} = \sin T$$

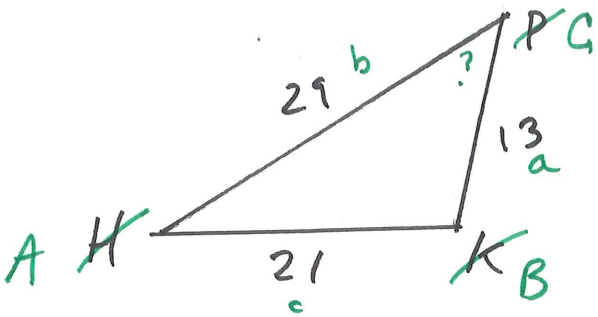
$$.545 = \sin T$$

INVERSE!

$$T = \sin^{-1}(.545\ldots)$$

$$\boxed{T = 33^\circ}$$

3. Find the measure of $\angle ?$ to the nearest degree.



No Angles... No pairs for sure!!
Law of Cosines it is....

Call the desired Angle "G"

Memorize:

$$c^2 = b^2 + a^2 - 2ab \cdot \cos G$$

$$21^2 = 29^2 + 13^2 - 2 \cdot 13 \cdot 29 \cdot \cos G$$

$$441 = 1010 - 754 \cos G$$ ← Not like terms!!

$$-1010 \qquad -1010$$

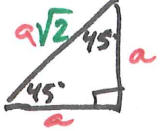
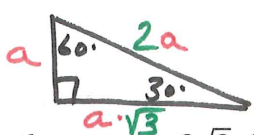
$$-569 = -754 \cos G$$

$$-754 \qquad -754$$

$$0.755\ldots = \cos G$$

Invert!!

$$G = \cos^{-1}(.755\ldots) \rightarrow 41^\circ$$

must know:  

SRT-C6a

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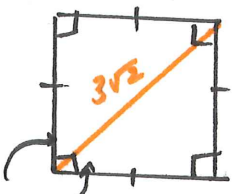
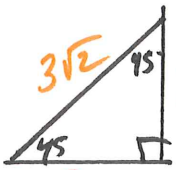
5. Find the perimeter of a square whose diagonal length measures $3\sqrt{2}$. Show all work

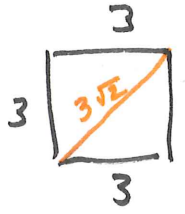


By Symmetry, these must be 45°



$3\sqrt{2} = a\sqrt{2}$ ← both are hypotenuse of the 45-45-90°

$\Rightarrow 3 = a$



Perimeter?

$3+3+3+3$

$4(3)$

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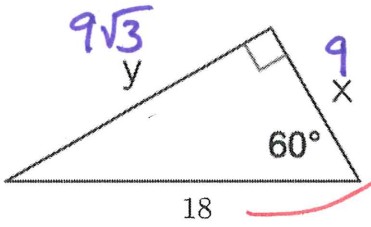
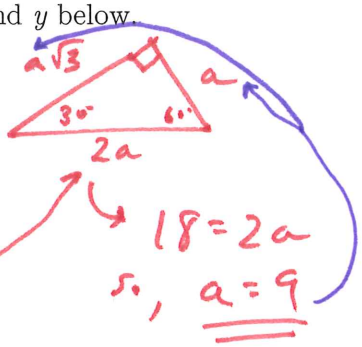
6. Find the exact values of x and y below.





$18 = 2a$

so, $a = 9$

$x = 9$

$y = 9\sqrt{3}$

SRT-C7a

7. Select all the true statements.

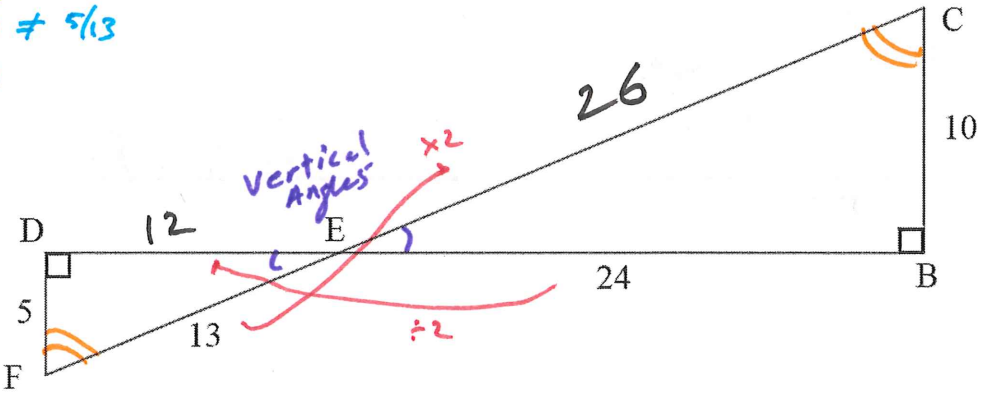
Note that: $\angle F + \angle E = 90°$

$\angle C + \angle E = 90°$

so $\angle F \cong \angle C$

- [ ] $\sin F = \sin E$ $\frac{12}{13} \neq \frac{5}{13}$
- [✓] $\sin F = \sin C$ $\frac{12}{13}$
- [ ] $\tan C = \tan E$ $\frac{24}{10} \neq \frac{5}{12}$
- [✓] $\sin E = \cos C$ $\frac{10}{26} = \frac{5}{12} = \frac{10}{26}$
- [✓] $\cos C = \cos F$ $\frac{10}{26} = \frac{5}{13}$
- [ ] $\sin C = \cos F$ $\frac{24}{26} = \frac{12}{13} \neq \frac{5}{13}$
- [ ] $\sin E = \sin C$ $\frac{5}{13} \neq \frac{12}{13}$

SOH CAH TOA



$\triangle DEF \sim \triangle BEC$ by AA~

- so $\angle F \cong \angle C$
- Scale factor: $\frac{10}{5} = 2$