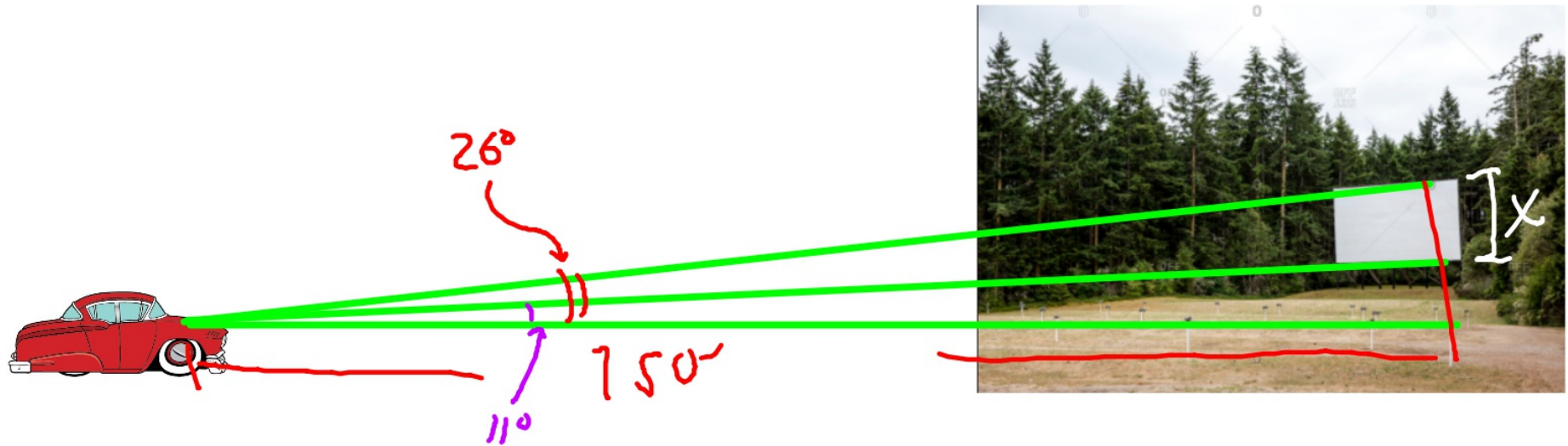
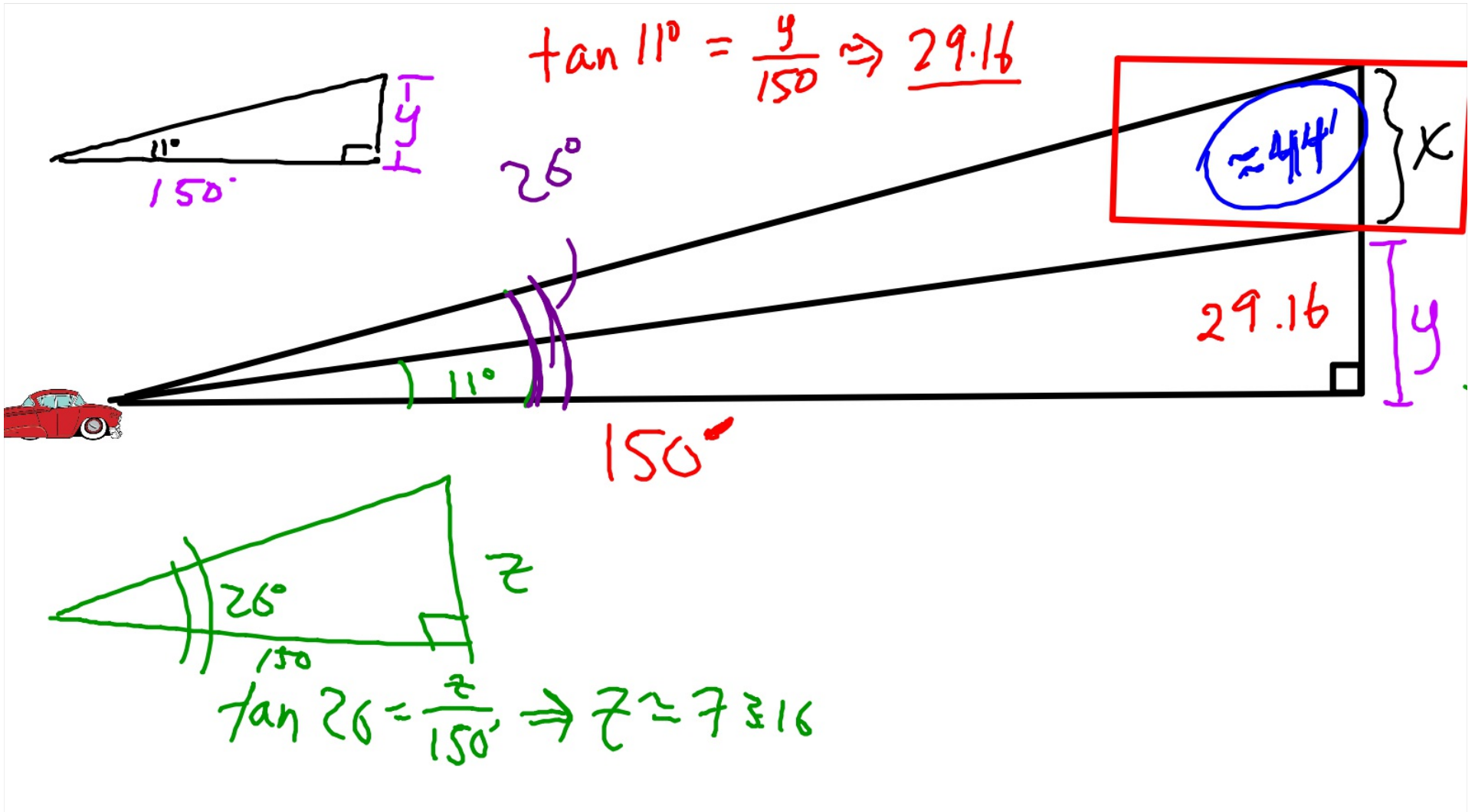


## Good afternoon: attach warm up then solve

You're at a drive in movie and located 150 feet away from the screen.  
Using a clinometer, the angle of elevation to the bottom edge of the screen is  $11^\circ$ , and the angle to the top edge of the screen is  $26^\circ$ .  
How tall is the screen?



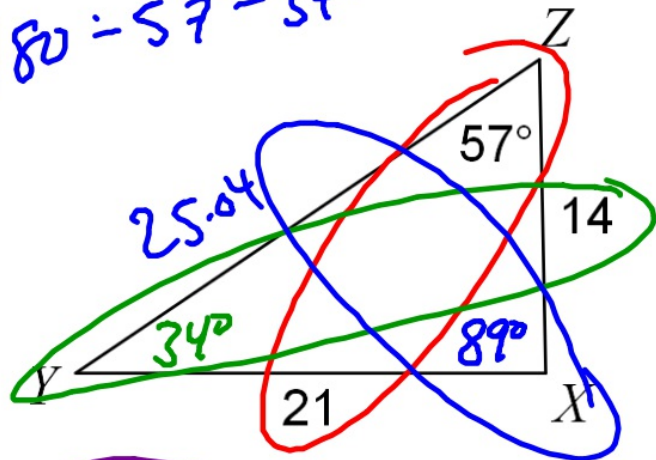


## HW answers #1-10

1.  $39^\circ$ , 37.08, 24.05
2.  $30^\circ$ , 8, 16.01
3.  $23^\circ$ , 20.04, 30.05
4.  $36^\circ$ , 14.02, 25.06
- 5.  $54^\circ$ ,  $43^\circ$ , 11.05
6.  $30^\circ$ , 21.04, 15
7.  $47^\circ$ , 18.96, 10.98
8.  $71^\circ$ , 14.96, 19.01
- 9.  $28^\circ$ ,  $116^\circ$ , 22.95
10.  $90^\circ$ , 16.99, 20.98

# Another look at the Law of Sines

$$180 = 57 + 34$$



$$\frac{\sin 89^\circ}{x} = \frac{\sin 57^\circ}{21} \neq \frac{\sin Y}{14}$$

$$21 \sin 89^\circ = x \sin 57^\circ$$

$$\frac{21 \sin 89^\circ}{\sin 57^\circ} = x$$

$$\underline{25.04} \approx x$$

$$\frac{14 \sin 57^\circ}{21} = \frac{2 \sin Y}{21}$$

$$0.559 = \sin Y$$

$$\sin^{-1}(0.559) = Y$$

$$\underline{34^\circ} = Y$$

# The Law of...Cosines???



## When to use the Law of Cosines

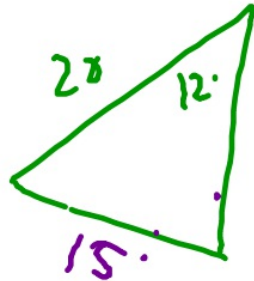
- looking for sides/angles of oblique triangles
- do not have a complete pair of known angle and opposite side

Law of Sines

AAS

ASA

SSA\*



Law of Cosines

SAS

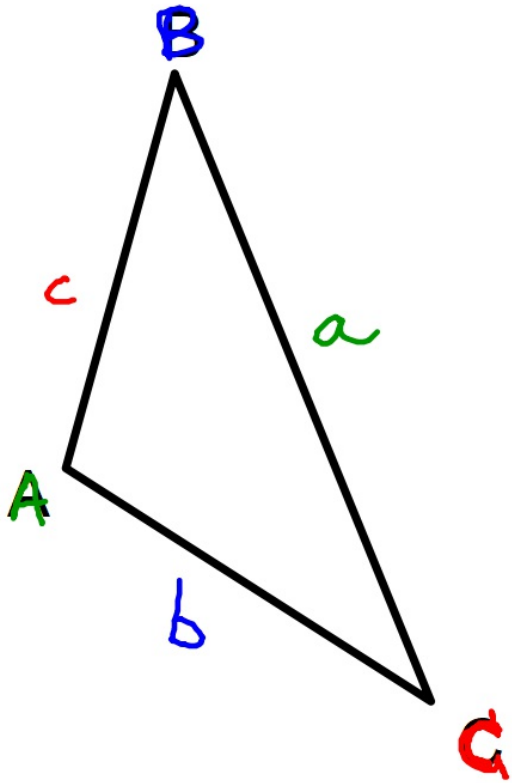
SSS

SAS  
SSS



ASA  
AAS  
SSA\*



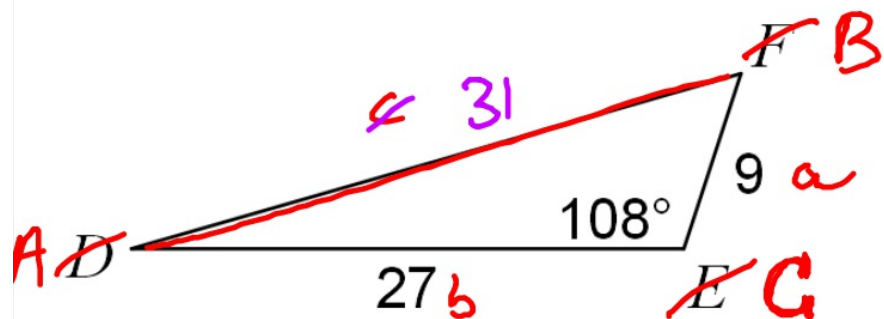


## The Law of Cosines

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

- an extension of the Pythagorean Theorem
- cba, abC
- looking for side? re-label it "c"
- looking for angle? re-label it "C"





Find the length of DF.  
Then, solve the triangle.

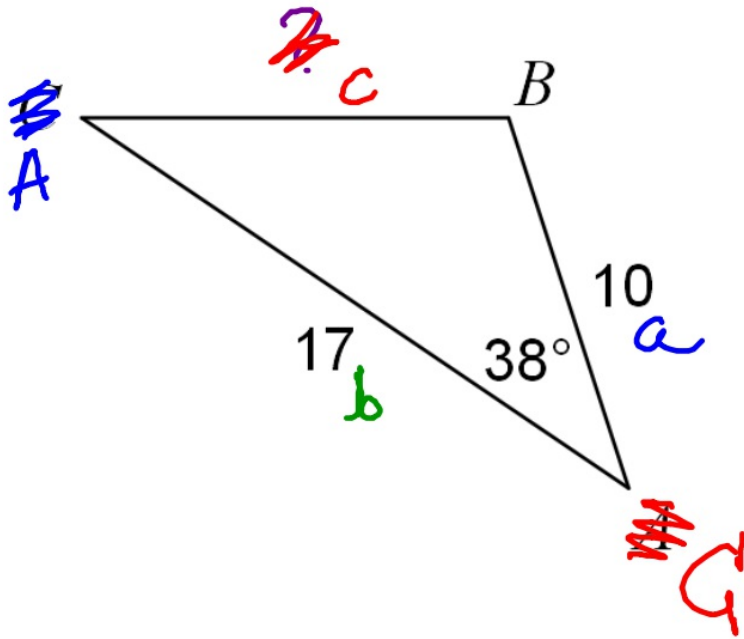
$$c^2 = b^2 + a^2 - 2ab \cos C$$

$$c^2 = 27^2 + 9^2 - 2(9)(27) \cdot \cos(108)$$

$$c^2 = 960.182$$

$$c = \sqrt{960.182}$$

$$c \approx 31$$



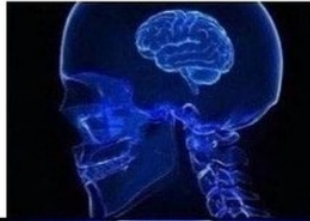
Find the length of CB.

$$c^2 = 10^2 + 17^2 - 2(10)(17) \cdot \cos$$

$$c^2 = 121.076$$

$$c = 11$$

Right triangle  
Trig



ASA



AAS

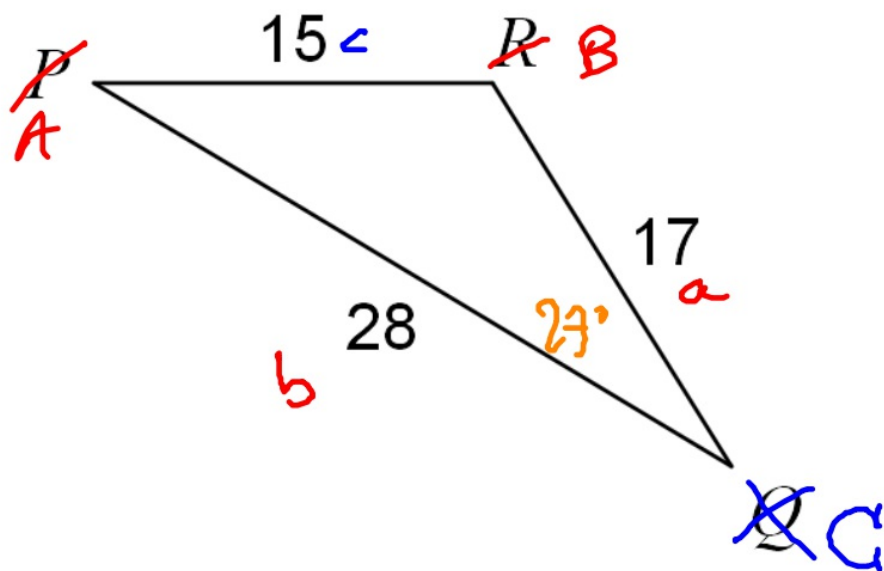


SAS



SSS





Find the missing angles.

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

$$15^2 = 28^2 + 17^2 - 2(28)(17) \cdot \cos C$$

$$225 = 1073 - 952 \cdot \cos C$$

$$\begin{array}{r} -1073 \\ \hline -1073 \end{array}$$

$$\begin{array}{r} -848 \\ \hline -952 \end{array} = \begin{array}{r} -952 \cos C \\ \hline -952 \end{array}$$

$$0.891 = \cos C$$

$$C = \cos^{-1}(0.891)$$

$$C = 27^\circ$$

Isolate  $\cos C$

inverse trig.

HW

backside of yesterday's handout #11-<sup>-15</sup>~~20~~