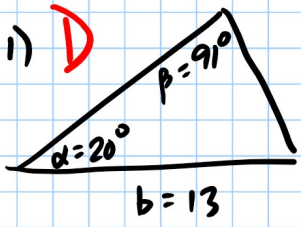
WARMUP

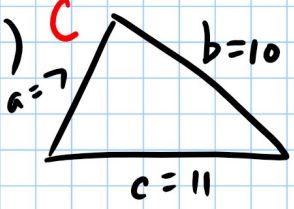
Which info are you given in each picture?

A) ASA
B) SAS
C) SSS
D) AAS
E) SSA

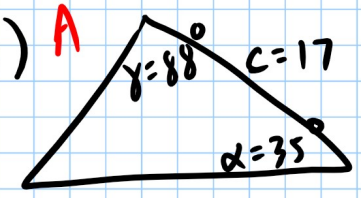
1) D



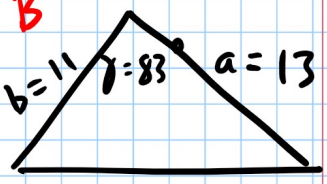
2) C



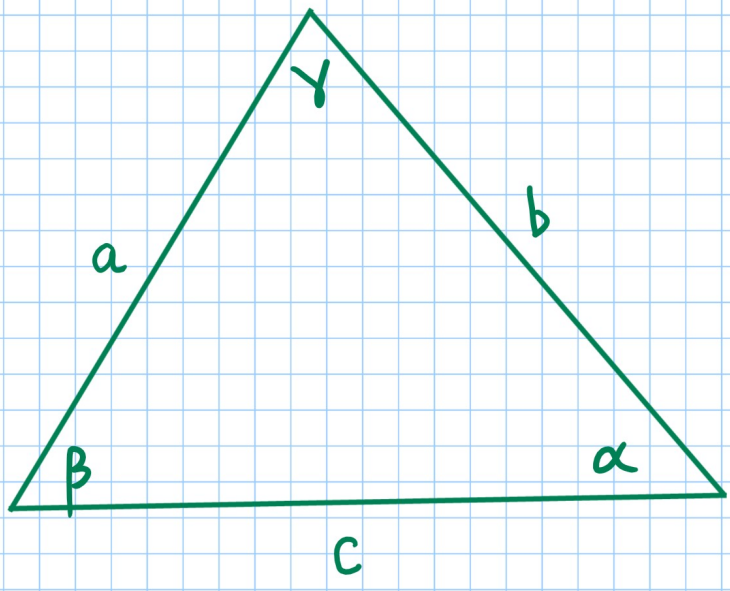
3) A



4) B



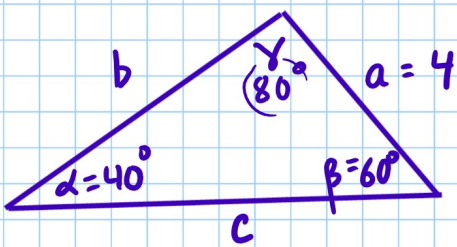
Section 7.2 The Law of Sines



$$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$$

Use Law of Sines with AAS, ASA, and SSA

ex: Solve the Δ : $\alpha = 40^\circ$, $\beta = 60^\circ$, $a = 4$



$\gamma =$ 80°

$b =$ 5.4

$c =$ 6.1

$\gamma = 180^\circ - 40^\circ - 60^\circ = 80^\circ$

$$\frac{\sin 40^\circ}{4} = \frac{\sin 60^\circ}{b}$$

$$\frac{b \sin 40^\circ}{\sin 40^\circ} = \frac{4 \sin 60^\circ}{\sin 40^\circ}$$

$4 * \sin 60^\circ / \sin 40^\circ$

$b = 5.4$

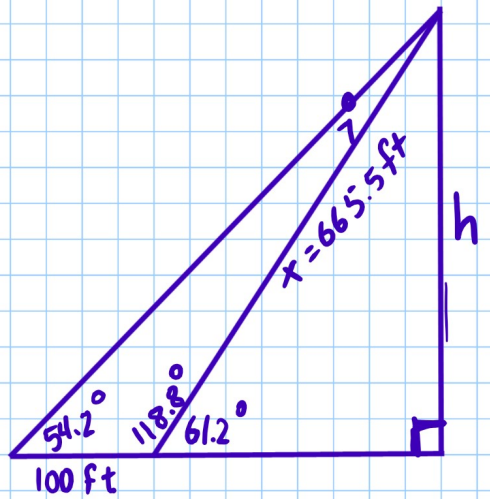
$$\frac{\sin 40^\circ}{4} = \frac{\sin 80^\circ}{c}$$

$$c \sin 40^\circ = 4 \sin 80^\circ$$

$$c = \frac{4 \sin 80^\circ}{\sin 40^\circ}$$

$c = 6.1$

ex: You visit the Washington Monument. From a distance you measure the angle of elevation to the top of the monument to be 61.2°. You then move 100 ft backwards and measure the angle to be 54.2°. How tall is the monument?



$\tan 54.2° = \frac{h}{100+d}$ $\tan 61.2° = \frac{h}{d}$

difficult way

$\frac{\sin 7°}{100} = \frac{\sin 54.2°}{x}$

$\frac{x \sin 7°}{\sin 7°} = \frac{100 \sin 54.2°}{\sin 7°}$

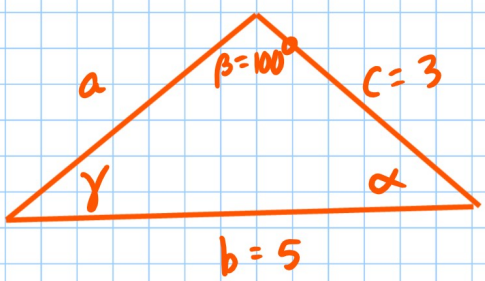
$x = 665.5$

$665.5 \cdot \sin 61.2° = \frac{h}{665.5} \cdot 665.5$

$h = 583.2 \text{ ft}$

p547-549 5, 13, 19, 34, 35, 36,
p537 48 (like Washington monument)

19) $b = 5$, $c = 3$, $\beta = 100°$



$\frac{\sin 100°}{5} = \frac{\sin \gamma}{3}$

$\frac{5 \sin \gamma}{5} = \frac{3 \sin 100°}{5}$

$\sin \gamma = 0.5909$

$\gamma = 36.2°$

$\gamma = 36.2°$

$\alpha = 43.8°$

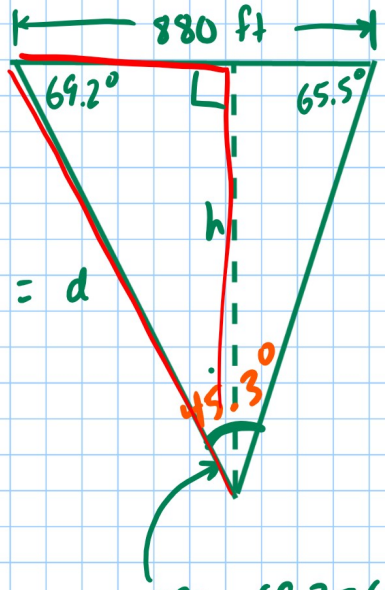
$a = 3.5$

$\alpha = 180 - 100 - 36.2$
$= 43.8°$

$\frac{\sin 43.8°}{a} = \frac{\sin 100°}{5}$

$\frac{a \sin 100°}{\sin 100°} = \frac{5 \sin 43.8°}{\sin 100°}$

34)



$$\frac{\sin 65.5^\circ}{d} = \frac{\sin 45.3^\circ}{880}$$

$$d = \frac{880 \sin 65.5^\circ}{\sin 45.3^\circ}$$

$$d = 1126.6$$

Law of Sines

SOH CAH TOA

$$\sin 69.2^\circ = \frac{h}{1126.6} \quad \text{OR} \quad \frac{\sin 90^\circ}{1126.6} = \frac{\sin 69.2^\circ}{h}$$

$$\boxed{h = 1053.2 \text{ ft}}$$