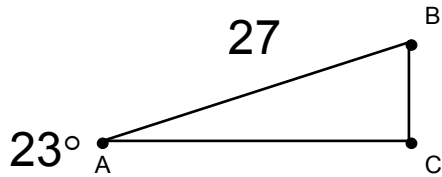


Handout Math 48C Mitchell Schoenbrun Lesson 9
Solving Triangles

For these right Triangles, draw a diagram and find the missing parts. Assume c is the hypotenuse.

1) $m\angle A = 23^\circ; c = 27$



$$\angle B = 90^\circ - 23^\circ = 67^\circ$$

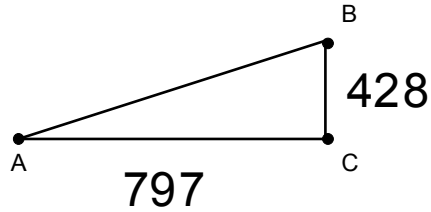
$$\cos(23^\circ) = AC / 27$$

$$AC = 27 \cos(23^\circ) \approx 24.85$$

$$27^2 = 24.85^2 + BC^2$$

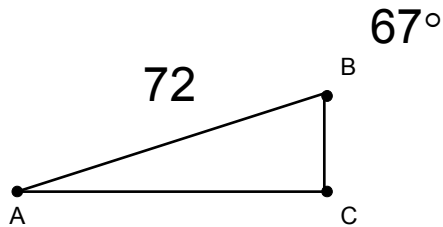
$$BC = \sqrt{27^2 - 24.85^2} \approx 10.56$$

3) $a = 428; b = 797$



Ooppse, we can't do this one yet

2) $m\angle B = 67^\circ; c = 72$



$$\angle B = 90^\circ - 67^\circ = 23^\circ$$

$$\cos(67^\circ) = \frac{BC}{72}$$

$$BC = 72 \cos(67^\circ) \approx 28.13$$

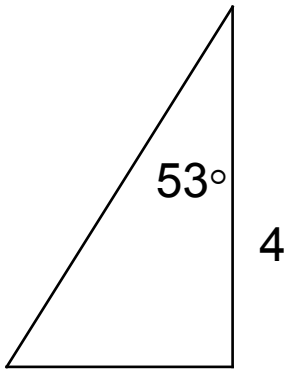
$$72^2 = 28.13^2 + AC^2$$

$$AC = \sqrt{72^2 - 28.13^2} \approx 66.28$$

4) $a = 11; b = 21$

Same here

5)



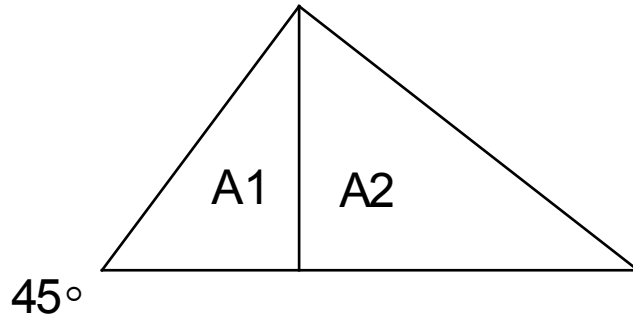
Missing complementary angle is 37°

$$\cos(53^\circ) = \frac{4}{Hyp}$$

$$Hyp = \frac{4}{\cos(53^\circ)} \approx 6.64$$

$$3rd\ side = \sqrt{6.64^2 - 4^2} \approx 5.3$$

7) In the diagram below, Areas $A_2 = 1.5 \times A_1$
Find the missing angles.



A_1 triangle is an Isosceles right triangle, so its other angle is also 45° .

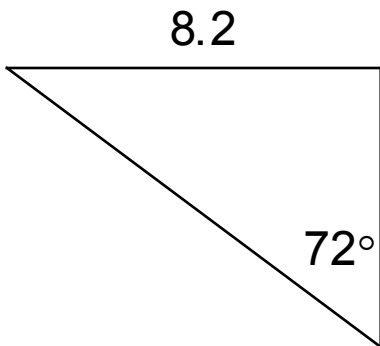
Base of A_2 is 1.5 base of A_1 .

Base angles of A_2 are 90° and

$$\tan^{-1}\left(\frac{1}{1.5}\right) \approx 33.7^\circ$$

third angle of A_2 is $\approx 90^\circ - 33.7^\circ = 56.3^\circ$

6)



Missing complementary angle is 18°

$$\sin(72^\circ) = \frac{8.2}{Hyp}$$

$$Hyp = \frac{8.2}{\sin(72^\circ)} \approx 8.62$$

$$3rd\ side = \sqrt{8.62^2 - 8.2^2} \approx 2.66$$

8) In the diagram below, $\angle BAC$ is bisected by \overline{AD} .
The area of $\triangle ACD$ is 3 x area of $\triangle ABD$.
Find all missing angles.

