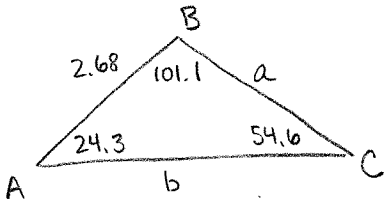
Name KEY

Precalculus Unit 9: 9.1-9.2 Homework
Law of Sines and Law of Cosines

For each of the following triangles, use the given information to solve the triangle. Find both triangles when necessary. Round all answers to the hundredths place.

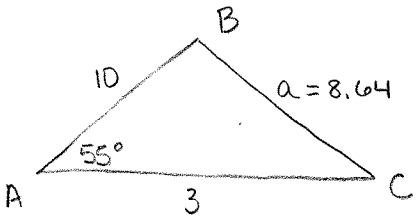
1. $A = 24.3°$, $C = 54.6°$, $c = 2.68$



$\frac{b}{\sin 101.1} = \frac{2.68}{\sin(54.6)}$ $\quad \frac{a}{\sin 24.3} = \frac{2.68}{\sin 54.6}$

$\angle B = 101.1°$
$b = 3.23$
$a = 1.35$

2. $A = 55°$, $b = 3$, $c = 10$

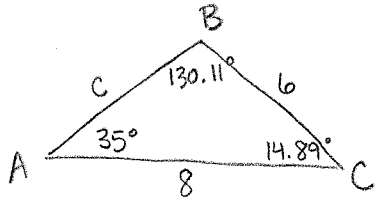


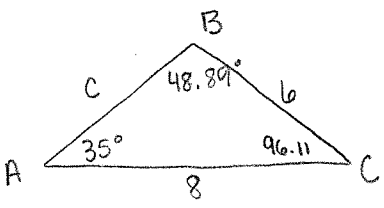
$a^2 = 3^2 + 10^2 - 2(3)(10)\cos 55°$
$a^2 = 74.585...$
$a = 8.64$

$a = 8.64$
$\angle C = 108.39°$
$\angle B = 16.61°$

$10^2 = 8.64^2 + 3^2 - 2(8.64)(3)\cos C$
$\cos C = -.315...$
$C = 108.39°$

3. $A = 35°$, $a = 6$, $b = 8$





$\frac{\sin B}{8} = \frac{\sin(35)}{6}$

$B = 49.89°$ - OR - $130.11°$
$C = 96.11°$ - OR - $14.89°$
$C = 10.40$ - OR - 2.69

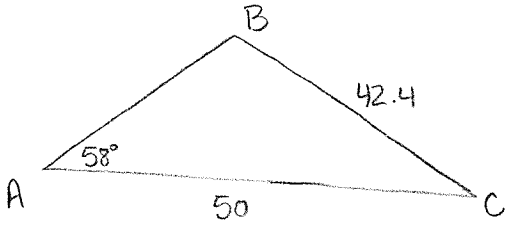
$\frac{c}{\sin 14.89} = \frac{6}{\sin 35}$

$\frac{c}{\sin(96.11)} = \frac{6}{\sin 35}$

$A = 58°$

4. $a = 42.4$

$b = 50$



$$\frac{\sin B}{50} = \frac{\sin 58°}{42.4}$$

$\sin B = 1.000058...$

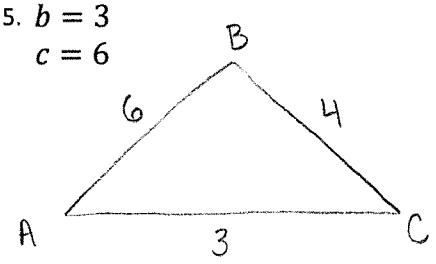
$\varnothing$

No such $\triangle$

$a = 4$

5. $b = 3$

$c = 6$



$4^2 = 6^2 + 3^2 - 2(6)(3)\cos A$

$A = 36.34°$

$6^2 = 4^2 + 3^2 - 2(4)(3)\cos C$

$C = 117.28°$

$B = 26.38°$

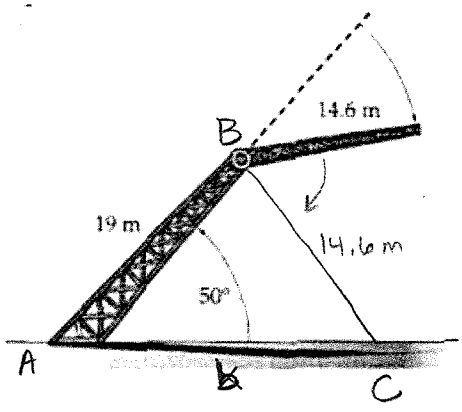
6. A hinged crane makes an angle of 50° with the ground. (see the figure). How far from the base of the crane does the top hit the ground?

$$\frac{\sin C}{19} = \frac{\sin(50)}{14.6}$$

$\angle C = 85.49$ - OR - 94.51

doesn't make sense in this problem for $\angle C$ to be obtuse

$\angle B = 44.51°$



$$\frac{b}{\sin 44.51} = \frac{14.6}{\sin 50}$$

$b = 13.36$ m