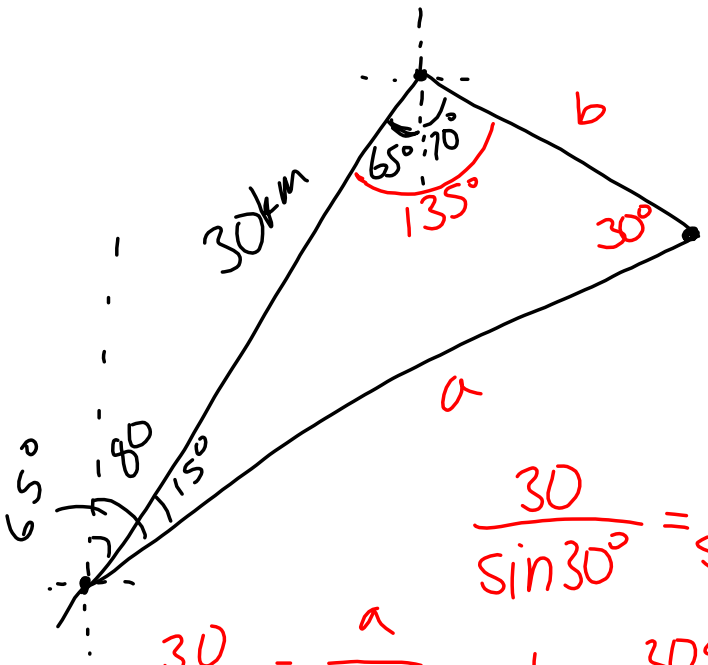
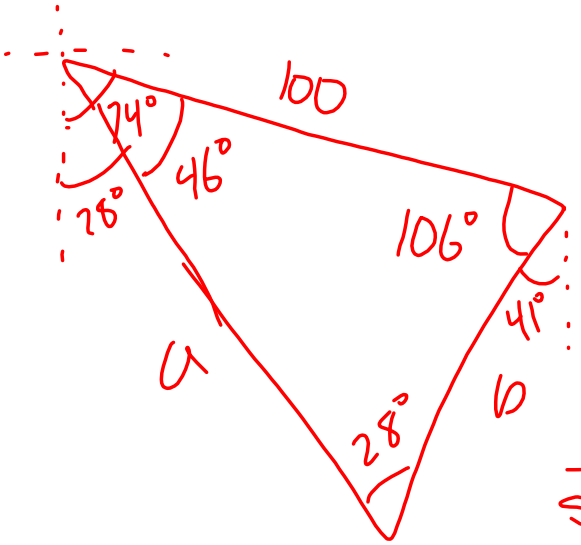
47)



$$\frac{30}{\sin 30^\circ} = \frac{b}{\sin 15^\circ}$$

$$\frac{30}{\sin 30^\circ} = \frac{a}{\sin 135^\circ} \qquad b = \frac{30 \sin 15^\circ}{\sin 30^\circ}$$

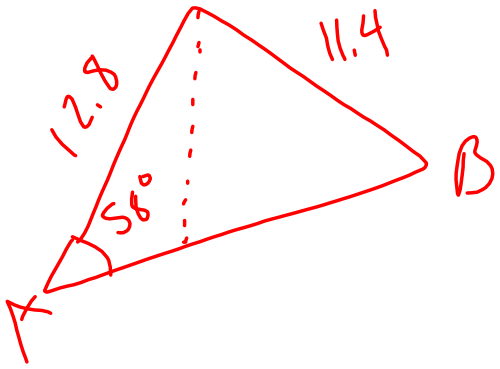
48)



$$\frac{100}{\sin 28^\circ} = \frac{a}{\sin 106^\circ}$$

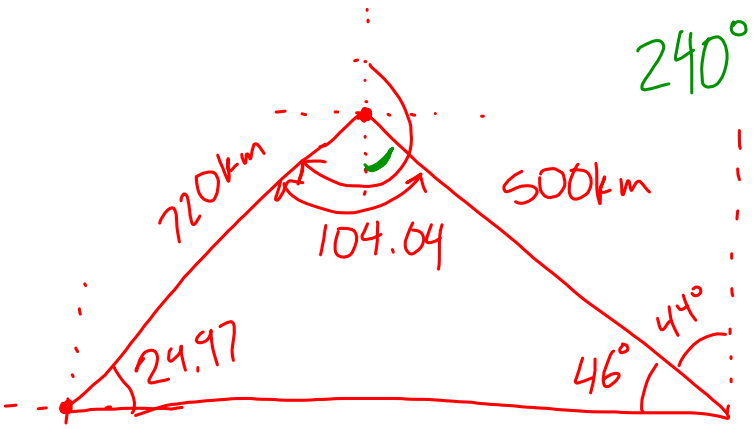
$$\frac{100}{\sin 28^\circ} = \frac{b}{\sin 46^\circ}$$

$A = 58°$ $a = 11.4$ $b = 12.8$



$A = 1$

$$\frac{25}{\sin 120} = \frac{25}{\sin B}$$



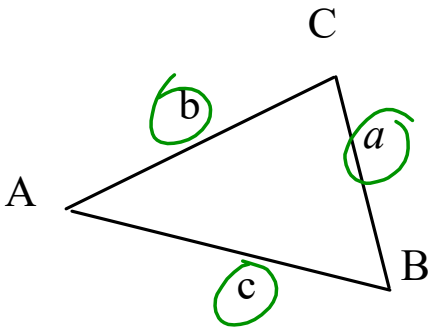
$$\frac{\sin 46^\circ}{720} = \frac{\sin B}{500}$$

$$B = \sin^{-1}\left(\frac{500\sin 46^\circ}{720}\right)$$

$$B = 29.97$$

Section 6.2 Law of Cosines

(SAS, SSS)



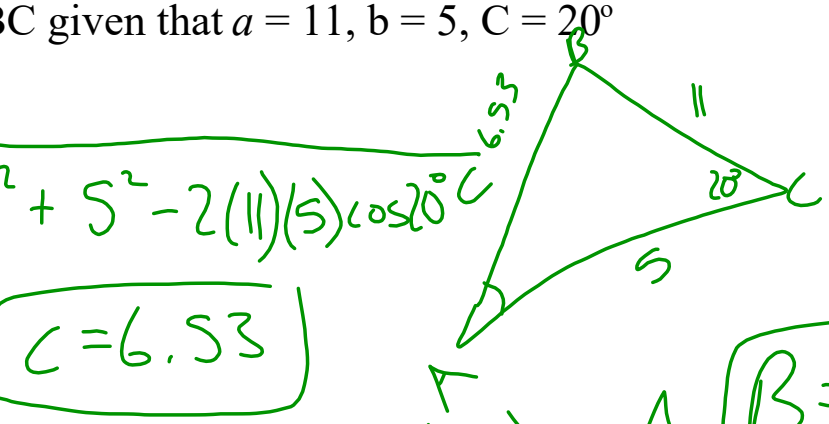
$a^2 = b^2 + c^2 - 2bc \cos A$

$b^2 = a^2 + c^2 - 2ac \cos B$

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

In the law of cosines, always choose the *largest* side or angle you can solve for first.

Solve △ABC given that $a = 11$, b = 5, C = 20°



$c = \sqrt{11^2 + 5^2 - 2(11)(5)\cos 20°}$ $c = 6.53$

$11^2 = 6.53^2 + 5^2 - 2(5)(6.53)\cos A$ $B = 15.2°$

$-6.53^2 - 5^2$

$\cos^{-1}\left(\frac{11^2 - 6.53^2 - 5^2}{-2(5)(6.53)}\right) = A = 144.8$

Solve △ABC given that $a = 9$, b = 7, c = 5

$9^2 = 7^2 + 5^2 - 2(7)(5)\cos A$

$9^2 - 7^2 - 5^2 = -2(7)(5)\cos A$

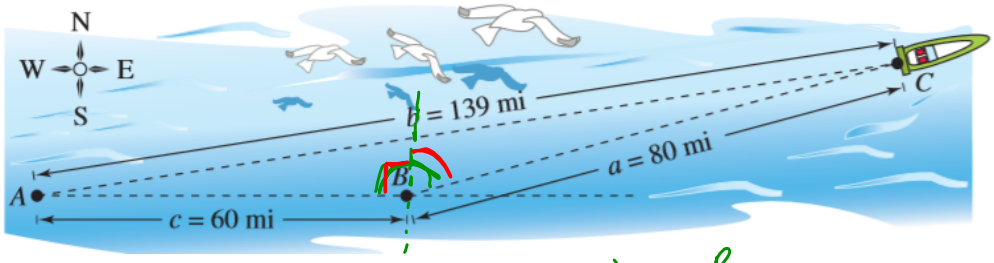
$\cos^{-1}\left(\frac{9^2 - 7^2 - 5^2}{-2(7)(5)}\right) = A = 95.7°$

$C = 33.5°$

$\frac{\sin 95.7°}{9} = \frac{\sin B}{7}$

$\sin^{-1}\left(\frac{7\sin 95.7°}{9}\right) = B = 50.7°$

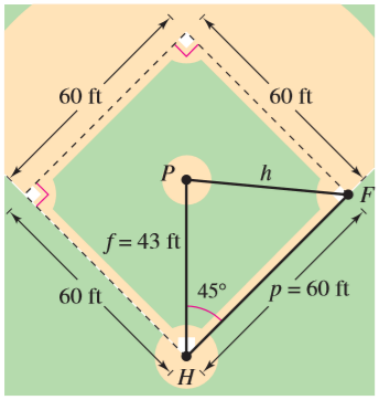
A ship travels 60 miles due east, then adjusts its course northward, as shown in the figure. After traveling 80 miles in that direction, the ship is 139 miles from its point of departure. Describe the bearing from point B to point C.



$139^2 = 60^2 + 80^2 - 2(60)(80)\cos B$

$B = \cos^{-1}\left(\frac{139^2 - 60^2 - 80^2}{-2(60)(80)}\right) = 166.2°$

N76.2°E



The pitcher's mound on a women's softball field is 43 feet from home plate and the distance between the bases is 60 feet. (The pitcher's mound is not halfway between home plate and second base.) How far is the pitcher's mound from first base?

Another way to find the area of a triangle

Heron's formula is nice because you don't have to have the height to find the area of a triangle.

Let a, b, and c be the sides of ΔABC, and let s denote the semiperimeter.

$$s = (a + b + c)/2$$

Then the area of ΔABC is given by:

$$\text{Area} = \sqrt{s(s - a)(s - b)(s - c)}$$

Find the area of ΔABC, Given: a = 5, b = 9, c = 7

$$s = (5+9+7)/2 = 10.5$$

$$A = \sqrt{10.5(10.5-5)(10.5-9)(10.5-7)}$$

$$= 17.4$$

Section 6.2 Pgs. 413 - 415

#7, 9, 13, 15, 17, 37, 39, 43, 45, 46, 47, 48, 52, 58, 59, 66