

Math Analysis
1.2, 1.3 Worksheet

1. In $\triangle KLM$, $k=7$, $l=9$, $m=5$, find all K, L, M

$$\cos K = \frac{9^2 + 5^2 - 7^2}{2(9)(5)}$$

$$\cos L = \frac{7^2 + 5^2 - 9^2}{2(7)(5)}$$

$$K = \cos^{-1}\left(\frac{9^2 + 5^2 - 7^2}{2(9)(5)}\right) \approx 50.704^\circ$$

$$L = \cos^{-1}\left(\frac{7^2 + 5^2 - 9^2}{2(7)(5)}\right)$$

$$L = 95.739$$

$$M = 33.557^\circ$$

↑
Subtract other
angles from 180°

2. In $\triangle ABC$, $a=8$, $c=12$, $B=40^\circ$, find b

$$b^2 = 8^2 + 12^2 - 2(8)(12) \cos 40$$

$$\approx 60.919$$

$$b \approx 7.805$$

3. In $\triangle PDQ$, $P=17^\circ$, $Q=139^\circ$, $d=6$, find p, q

$$\frac{\sin 17}{p} = \frac{\sin 139}{q} = \frac{\sin 24}{6}$$

$$\frac{\sin 17}{p} = \frac{\sin 24}{6}$$

$$\frac{\sin 139}{q} = \frac{\sin 24}{6}$$

$$p \sin 24 = 6 \sin 17$$

$$p = \frac{6 \sin 17}{\sin 24} \approx 4.313$$

$$q \sin 24 = 6 \sin 139$$

$$q = \frac{6 \sin 139}{\sin 24} \approx 9.678$$

4. In $\triangle BFC$, $b = 7$, $f = 4$, $c = 2$, find F

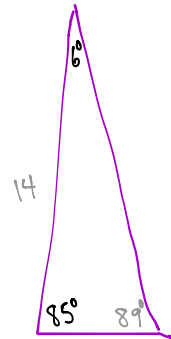
$$\cos F = \frac{7^2 + 2^2 - 4^2}{2(7)(2)}$$

$$F = \cos^{-1}\left(\frac{7^2 + 2^2 - 4^2}{2(7)(2)}\right) = \text{D.N.E.}$$

5. In $\triangle JAL$, $j = 14$, $A = 6^\circ$, $L = 85^\circ$, find a, l

$$\frac{\sin 85}{2} = \frac{\sin 89}{14} = \frac{\sin b}{a} \Rightarrow \frac{\sin 89}{14} = \frac{\sin b}{a}$$

$$\frac{14 \sin 85}{\sin 89} = l \approx 13.949 \quad a = \frac{14 \sin 6}{\sin 89} \approx 1.464$$



6. In $\triangle RCQ$, $R = 64^\circ$, $C = 18^\circ$, $c = 7$, find r, q

$$Q = 98^\circ \quad \frac{\sin 98}{q} = \frac{\sin 18}{7} = \frac{\sin 64}{r} \Rightarrow \frac{\sin 18}{7} = \frac{\sin 64}{r}$$

$$\frac{\sin 98}{q} = \frac{\sin 18}{7} \Rightarrow q = \frac{7 \sin 98}{\sin 18} \approx 22.432$$

$$r \sin 18 = 7 \sin 64$$

$$r = \frac{7 \sin 64}{\sin 18} \approx 20.360$$



7. Find the area of problem # 3.

$$A = \frac{1}{2} dq \sin P = \frac{1}{2} (6)(q) \sin(17)$$

$$\text{use store function on calculator} \rightarrow q = \frac{6 \sin 139}{\sin 24} \approx 9.678$$

$$A \approx 8.489$$

8. Find the area of problem # 6.

$$A = \frac{1}{2} cr \sin Q = \frac{1}{2} 7(r) \sin 98 = 70.566$$

use stored value from calculator