

# Law of Cosines Practice

Math 130 Kovitz

A. The rule of supplements is

$$\cos(x) = -\cos(\pi - x).$$

Use this and the trig tables (as needed) to find  $\arccos C$  if  $\cos C$  is as given and  $\pi/2 < C < \pi$ . Also find  $C$  in degrees.

(This exercise serves as practice in using trig tables to further understanding of the rule of supplements; use a calculator only to check your answers. In the future, if you wish, you may solve similar problems directly with a calculator.)

Answer

- |                           |                         |
|---------------------------|-------------------------|
| 1. $\cos C = -.5000$      | $\approx 2.09$ rad      |
| 2. $\cos C = -.5807$      | $\approx 2.19$ rad      |
| 3. $\cos C = -1/5$        | $\approx 101^\circ 32'$ |
| 4. $\cos C = -.8141$      | $\approx 144^\circ 30'$ |
| 5. $\cos C = -\sqrt{3}/2$ | $5\pi/6$ rad            |
| 6. $\cos C = -.7071068$   | $\approx 2.36$ rad      |
| 7. $\cos C = -1$          |                         |

B. Use the Law of Cosines to find the values required. Use trig tables or a calculator (as needed). If you used trig tables, check your answers with a calculator.

Sketch the triangle—does it look right?

Given	Given	Given	Find	Answer
1. $a = 2$	$b = 5$	$c = 4$	$A$ and $B$	$B \approx 108.20996^\circ$
2. $C = 1.266103673$ rad	$a = 5$	$b = 4$	$c$	$c \approx \sqrt{29}$
3. $C = \pi/6$	$b = 10$	$c = 7$	$a$	
4. $a = 2$	$b = 3$	$c = 4$	$A, B, C$	$A \approx 28.955024^\circ$
5. $a = 9$	$c = \sqrt{73}$	$C \approx 1.230959417$ rad	$b$	$b \approx 2$ or $b \approx 4$
6. $a = 12$	$b = 10$	$C = 120^\circ$	$c, B$	
7. $a = 6$	$b = 7$	$c = 10$	$A, B, C$	$C \approx 100.28656^\circ$