

Homework 5-2: Law of Cosines

Find each measurement indicated. Round your answers to the nearest tenth.

1) Find AC

$b^2 = 25^2 + 28^2 - 2(25)(28)\cos 66^\circ$
 $b = 29.0 \text{ mi}$

2) Find AC

$b^2 = (17)^2 + (30)^2 - 2(17)(30)\cos 32^\circ$
 $b = 18.0 \text{ km}$

3) Find AB

$c^2 = 19^2 + 14^2 - 2(19)(14)\cos 104^\circ$
 $c = 26.2 \text{ yd}$

4) Find AB

$c^2 = (25)^2 + (30)^2 - 2(25)(30)\cos 101^\circ$
 $c = 42.6 \text{ cm}$

5) Find AB

$c^2 = 30^2 + 25^2 - 2(30)(25)\cos 106^\circ$
 $c = 44.0 \text{ mi}$

6) Find $m\angle B$

$a^2 = 29^2 + 21^2 - 2(29)(21)\cos 109^\circ$
 $a = 41.0 \text{ in}$
 $\frac{\sin B}{21} = \frac{\sin 109^\circ}{a}$
 $B = 29^\circ$

7) Find $m\angle C$

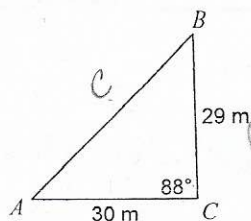
$b^2 = 18^2 + 29^2 - 2(18)(29)\cos 85^\circ$
 $b = 32.8$
 $\frac{\sin 85^\circ}{b} = \frac{\sin C}{29}$ (Use \sin^{-1})
 $C = 62^\circ$ (Use Unrounded #)

8) Find $m\angle C$

$b^2 = 25^2 + 24^2 - 2(25)(24)\cos 98^\circ$
 $b = 36.986$
 $\frac{\sin 98^\circ}{b} = \frac{\sin C}{24}$ (Use \sin^{-1})
 $C = 40^\circ$

Solve each triangle. Round your answers to the nearest tenth.

9)



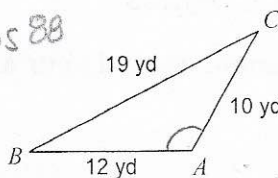
$$c^2 = 29^2 + 30^2 - 2(30)(29)\cos 88$$

$$c = 41.0$$

$$\frac{\sin A}{29} = \frac{\sin 88}{c}$$

$$A = 45^\circ \quad B = 47^\circ$$

10)

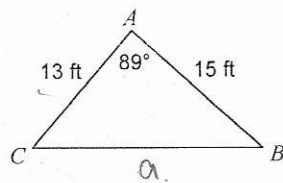


$$19^2 = 12^2 + 10^2 - 2(12)(10)\cos A$$

$$\frac{19^2 - 12^2 - 10^2}{-2(12)(10)} = \cos A$$

$$A = 119^\circ$$

11)



$$a^2 = 13^2 + 15^2 - 2(13)(15)\cos 89$$

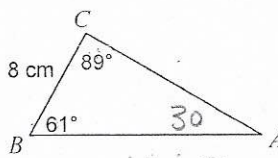
$$a = 19.7$$

$$\frac{\sin 89}{a} = \frac{\sin B}{13}$$

$$B = 41^\circ$$

$$C = 50^\circ$$

12)



$$A = 30^\circ$$

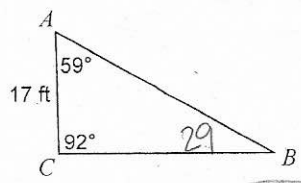
$$\frac{\sin 30}{8} = \frac{\sin 89}{c}$$

$$\frac{\sin 61}{b} = \frac{\sin 30}{8}$$

$$c = 16.0 \text{ cm}$$

$$b = 14.0 \text{ cm}$$

13)



$$\frac{\sin 29}{17} = \frac{\sin 92}{c}$$

$$B = 29^\circ$$

$$c = 35.0 \text{ ft}$$

$$\frac{\sin 59}{a} = \frac{\sin 29}{17}$$

$$a = 30.1 \text{ ft}$$

Find the exact value of each trigonometric function.

14) $\sec -765^\circ$

$$\sqrt{2}$$

15) $\cot 240^\circ$

$$\frac{\sqrt{3}}{3}$$

$$\tan = \sqrt{3}$$

$$\cot = \frac{1}{\sqrt{3}}$$

16) $\cot 600^\circ$

$$\frac{\sqrt{3}}{3}$$

17) $\cos 0^\circ$

$$1$$

Find the exact value of each expression.

18) $\sin^{-1}\left(\cot \frac{3\pi}{4}\right)$

$$\sin^{-1}(-1)$$

$$\frac{3\pi}{2}$$

19) $\sin^{-1}(\sec \pi)$

$$\sin^{-1}(-1)$$

$$\frac{3\pi}{2}$$

20) $\sin\left(\tan^{-1}\left(\frac{\sqrt{3}}{3}\right)\right)$

$$\sin(30)$$

$$= \frac{1}{2}$$

21) $\cos^{-1}(\sec 0)$

$$\cos^{-1}(1) = 0$$