# **Precalculus**

# Trigonometric functions computable with algebraic numbers using special angles

**Todor Milev** 

2019

Find the exact value of the trigonometric function using radicals.

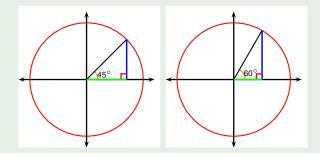
 $cos(105^{\circ})$ 

Find the exact value of the trigonometric function using radicals.

$$\cos(105^{\circ}) = \cos(45^{\circ} + 60^{\circ})$$

Find the exact value of the trigonometric function using radicals.

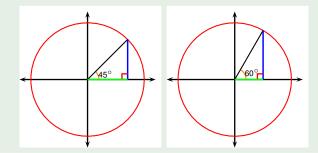
$$\cos(105^{\circ}) = \cos(45^{\circ} + 60^{\circ})$$



Find the exact value of the trigonometric function using radicals.

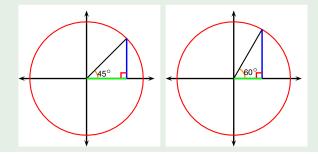
$$cos(105^{\circ}) = cos(45^{\circ} + 60^{\circ})$$
=?

we know the trig f-ns of 45° and 60° Angle sum f-la



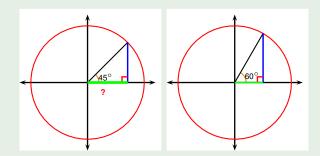
Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$
 we know the tr  
f-ns of 45° and Angle sum f-la



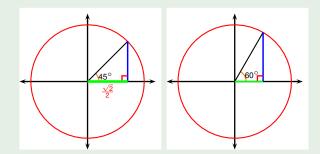
Find the exact value of the trigonometric function using radicals.

$$cos(105^\circ)=cos(45^\circ+60^\circ)$$
 we know the tr  
 $=cos(45^\circ)cos(60^\circ)-sin(45^\circ)sin(60^\circ)$  and Angle sum f-la  
 $=2$   $\cdot 2$   $\cdot 2$ 



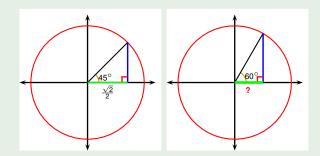
Find the exact value of the trigonometric function using radicals.

$$\cos(105^{\circ}) = \cos(45^{\circ} + 60^{\circ})$$
  
=  $\cos(45^{\circ}) \cos(60^{\circ}) - \sin(45^{\circ}) \sin(60^{\circ})$  f-ns of 45° and Angle sum f-la  
=  $\frac{\sqrt{2}}{2} \cdot ? - ? \cdot ?$ 



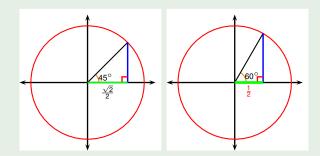
Find the exact value of the trigonometric function using radicals.

$$\cos(105^{\circ}) = \cos(45^{\circ} + 60^{\circ})$$
  
=  $\cos(45^{\circ}) \cos(60^{\circ}) - \sin(45^{\circ}) \sin(60^{\circ})$  f-ns of 45° and Angle sum f-la  
=  $\frac{\sqrt{2}}{2} \cdot ? - ? \cdot ?$ 



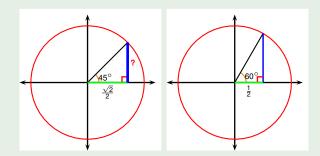
Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$
  
=  $\cos(45^\circ) \cos(60^\circ) - \sin(45^\circ) \sin(60^\circ)$  f-ns of 45° and Angle sum f-la =  $\frac{\sqrt{2}}{2} \cdot \frac{1}{2} - ?$ 



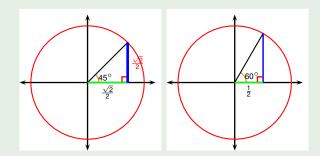
Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$
  
=  $\cos(45^\circ)\cos(60^\circ) - \sin(45^\circ)\sin(60^\circ)$  f-ns of 45° and Angle sum f-la =  $\frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{?}{2}$ 



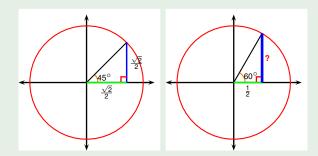
Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$
  
=  $\cos(45^\circ) \cos(60^\circ) - \sin(45^\circ) \sin(60^\circ)$  | We know the transfer of 45° and Angle sum f-la  $= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot ?$ 



Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$
  
=  $\cos(45^\circ) \cos(60^\circ) - \sin(45^\circ) \sin(60^\circ)$  f-ns of 45° and Angle sum f-la =  $\frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot$ ?

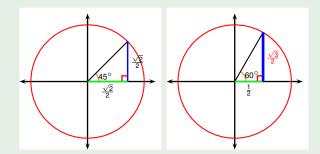


Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$

$$= \cos(45^\circ) \cos(60^\circ) - \sin(45^\circ) \sin(60^\circ)$$

$$= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2}$$
we know the tr f-ns of 45° and Angle sum f-la



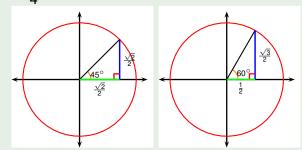
Find the exact value of the trigonometric function using radicals.

$$\cos(105^\circ) = \cos(45^\circ + 60^\circ)$$

$$= \cos(45^\circ) \cos(60^\circ) - \sin(45^\circ) \sin(60^\circ)$$

$$= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2}$$

$$= \frac{\sqrt{2} - \sqrt{6}}{4}.$$
we know the tr f-ns of 45° and Angle sum f-la



Find the exact value of the trigonometric function using radicals.

$$\cos(105^{\circ}) = \cos(45^{\circ} + 60^{\circ})$$

$$= \cos(45^{\circ}) \cos(60^{\circ}) - \sin(45^{\circ}) \sin(60^{\circ})$$
we know the tr f-ns of 45° and Angle sum f-la
$$= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2}$$

$$= \frac{\sqrt{2} - \sqrt{6}}{4}.$$

