

Pre Calculus 7 3 Part II Half Angle

Lesson 196 | Precalculus | Half-angle and power-reduction identities

<https://www.youtube.com/watch?v=YLFw7NzZYVI>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 For $0 < \theta < \pi$, $\cos \theta = 3/9$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

02 For $0 < \theta < \pi$, $\cos \theta = 2/12$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

03 For $0 < \theta < \pi$, $\cos \theta = 10/19$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

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04

For $0 < \theta < \pi$, $\cos \theta = 7/10$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

05

For $0 < \theta < \pi$, $\cos \theta = 12/25$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

06

For $0 < \theta < \pi$, $\cos \theta = 13/24$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

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01

For $0 < \theta < \pi$, $\cos \theta = 3/9$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1-3/9)/2} = \sqrt{(3)/3}$.
 $\cos(\theta/2) = \sqrt{(1+3/9)/2} = \sqrt{(6)/3}$.

02

For $0 < \theta < \pi$, $\cos \theta = 2/12$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1-2/12)/2} = \sqrt{(15)/6}$.
 $\cos(\theta/2) = \sqrt{(1+2/12)/2} = \sqrt{(21)/6}$.

03

For $0 < \theta < \pi$, $\cos \theta = 10/19$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1-10/19)/2} = 3 \cdot \sqrt{(38)/38}$.
 $\cos(\theta/2) = \sqrt{(1+10/19)/2} = \sqrt{(1102)/38}$.

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04

For $0 < \theta < \pi$, $\cos \theta = 7/10$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1 - 7/10)/2} = \sqrt{(15)/10}$.
 $\cos(\theta/2) = \sqrt{(1 + 7/10)/2} = \sqrt{(85)/10}$.

05

For $0 < \theta < \pi$, $\cos \theta = 12/25$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1 - 12/25)/2} = \sqrt{(26)/10}$.
 $\cos(\theta/2) = \sqrt{(1 + 12/25)/2} = \sqrt{(74)/10}$.

06

For $0 < \theta < \pi$, $\cos \theta = 13/24$. Find exact $\sin(\theta/2)$ and $\cos(\theta/2)$.

$\theta/2$ is in quadrant I, so both roots are positive. $\sin(\theta/2) = \sqrt{(1 - 13/24)/2} = \sqrt{(33)/12}$.
 $\cos(\theta/2) = \sqrt{(1 + 13/24)/2} = \sqrt{(111)/12}$.