

Watch. Practice. Understand. | Lesson 237

Pre Calculus Honors 7 3 Part II Half Angle and Power Reducing

Watch the matching video: <https://www.youtube.com/watch?v=EKQYLCdU3-s>

Practice focus: Half-angle and power-reduction identities

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Find $\sin 15^\circ$ exactly using a half-angle formula.

02 Find $\cos(\pi/8)$ exactly.

03 Rewrite $\cos^2 x$ in terms of $\cos 2x$.

04 If $\cos x = -3/5$ and $\pi < x < 3\pi/2$, find $\sin(x/2)$.

Worked answers | Lesson 237

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Practice focus: Half-angle and power-reduction identities

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01 Find $\sin 15^\circ$ exactly using a half-angle formula.

$$\sin 15^\circ = \sqrt{(1 - \cos 30^\circ)/2} = \sqrt{(2 - \sqrt{3})/2} = (\sqrt{6} - \sqrt{2})/4.$$

02 Find $\cos(\pi/8)$ exactly.

Positive in quadrant I: $\sqrt{(1 + \cos(\pi/4))/2} = \sqrt{(2 + \sqrt{2})/2}.$

03 Rewrite $\cos^2 x$ in terms of $\cos 2x$.

$$\cos^2 x = (1 + \cos 2x)/2.$$

04 If $\cos x = -3/5$ and $\pi < x < 3\pi/2$, find $\sin(x/2)$.

$x/2$ is in quadrant II, where sine is positive. $\sin(x/2) = \sqrt{(1 + 3/5)/2} = 2/\sqrt{5}.$