C_16 Key and Chapter 6 review

Thursday, May 25, 2023 6:00 PM

C_16 Chapter 6 review

Chapter 6.1-6.3 – some REVIEW

1. If B is an angle in standard position, $\sin B = -\frac{2}{5}$ and $\cot B > 0$, find the exact value of:

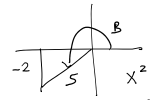
a) $\sec B$

b) $\sin 2B$

c) $\cos 2B$

2. Find the ***exact value*** of $\sin(255^\circ)$.

C_16 Chapter 6 review



Chapter 6.1-6.3 – some REVIEW

1. If B is an angle in standard position, $\sin B = -\frac{2}{5}$ and $\cot B > 0$, find the exact value of:

$x^2 + (-2)^2 = 5^2$

$x^2 + 4 = 25$

$x^2 = 21$

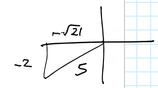
$x = \pm\sqrt{21}$

Because of the location, we need $x = -\sqrt{21}$

a) $\sec B$

$= \frac{1}{\cos B}$

$= \frac{1}{\frac{-\sqrt{21}}{5}} = \boxed{\frac{5}{-\sqrt{21}}}$



b) $\sin 2B$

$= 2 \sin B \cos B$

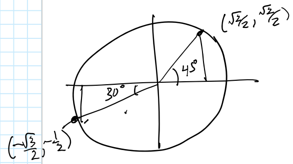
$= \left(\frac{2}{1}\right)\left(-\frac{2}{5}\right)\left(-\frac{\sqrt{21}}{5}\right) = \boxed{\frac{4\sqrt{21}}{25}}$

c) $\cos 2B$ $= \cos^2 B - \sin^2 B$

$= \left(-\frac{\sqrt{21}}{5}\right)^2 - \left(-\frac{2}{5}\right)^2$

$= \frac{21}{25} - \frac{4}{25} = \boxed{\frac{17}{25}}$

2. Find the ***exact value*** of $\sin(255^\circ)$.



$= \sin(210^\circ + 45^\circ)$

$= \sin 210^\circ \cos 45^\circ + \cos 210^\circ \sin 45^\circ$

$= \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(-\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$

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

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

3. Find the ***exact value*** of: $\cos\frac{\pi}{4}\cos\frac{\pi}{12}+\sin\frac{\pi}{4}\sin\frac{\pi}{12}$

4. Prove the following identity.

$$\frac{\sin 2x}{1+\cos 2x}=\frac{\sec^2 x-1}{\tan x}$$

5. Prove the following identity.

$$\frac{\tan x-\sin x}{\sin^3 x}=\frac{\sec x}{1+\cos x}$$

3. Find the ***exact value*** of: $\cos\frac{\pi}{4}\cos\frac{\pi}{12}+\sin\frac{\pi}{4}\sin\frac{\pi}{12}$

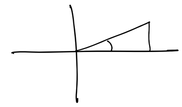
$= \cos\left(\frac{\pi}{4}-\frac{\pi}{12}\right)$

$= \cos\left(\frac{3\pi}{12}-\frac{\pi}{12}\right)$

$= \cos\left(\frac{2\pi}{12}\right)$

$= \cos\left(\frac{\pi}{6}\right) = \boxed{\frac{\sqrt{3}}{2}}$

from the identity for $\cos(A-B)$



4. Prove the following identity.

$$\frac{\sin 2x}{1+\cos 2x}=\frac{\sec^2 x-1}{\tan x}$$

$$\frac{2\sin x\cos x}{\cancel{1}+(2\cos^2 x-\cancel{1})} \qquad \frac{\tan^2 x}{\tan x}$$

$$\frac{\cancel{2}\sin x\cancel{\cos x}}{\cancel{2}\cos^{\cancel{2}} x} \qquad \tan x$$

$$\frac{\sin x}{\cos x} \qquad \frac{\sin x}{\cos x}$$

5. Prove the following identity.

$$\frac{\tan x-\sin x}{\sin^3 x}=\frac{\sec x}{1+\cos x}$$

$$\frac{\cos x\left(\frac{\sin x}{\cos x}-\sin x\right)}{\cos x\left(\sin^3 x\right)} \qquad \frac{\left(\frac{1}{\cancel{\cos x}}\right)\cancel{\cos x}}{(1+\cos x)\cos x}$$

$$\frac{\frac{\cancel{\cos x}\sin x}{\cancel{\cos x}}-\sin x\cos x}{\cos x(\sin^3 x)} \qquad \frac{1}{\cos x(1+\cos x)}$$

$$\frac{\sin x-\sin x\cos x}{\cos x(\sin^3 x)} \qquad \frac{1}{\cos x(1+\cos x)}\cdot\frac{(1-\cos x)}{(1-\cos x)}$$

$$\frac{\cancel{\sin x}(1-\cos x)}{\cos x(\sin^{\cancel{3}\,2} x)} \qquad \frac{1-\cos x}{\cos x(1-\cancel{\cos x}+\cancel{\cos x}-\cos^2 x)}$$

$$\frac{1-\cos x}{\cos x(\sin^2 x)} \qquad \frac{1-\cos x}{\cos x(1-\cos^2 x)}$$

$$\frac{1-\cos x}{\cos x(\sin^2 x)}$$