Name Mine Date _____

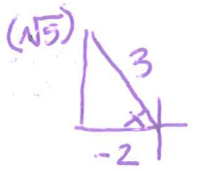
Math 112: Quiz 7.3:

1. Using appropriate identities, compute the exact value of $\sin 2x$ if:

$\cos x = -\frac{2}{3}, \quad \frac{\pi}{2} < x < \pi$ (show your steps):

+2

$\pi/2 < x < \pi$ → II



$\sin x = \frac{\sqrt{5}}{3}$

+1

$\sin 2x = 2\sin x \cos x$

$= 2 \cdot \frac{\sqrt{5}}{3} \cdot \frac{-2}{3} = \frac{-4\sqrt{5}}{9}$

+1

2. Determine two different identities to which could be used to calculate $\cos(105°)$ in terms of well-known trigonometric values. then choose one of the identities and use it to find the exact value of $\cos(105°)$. (*Hint:* How can 105° be written as a sum, difference, double angle, or half angle of some angle(s) for which you can easily calculate trig functions?)

+3

$\cos 105° \leftarrow$ 2nd Q is (−)

1) $\cos(45° + 60°)$

$= \cos 45° \cdot \cos 60° - \sin 45° \sin 60°$

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

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

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

$\cos\left(\frac{210°}{2}\right)$

$= -\sqrt{\frac{1+\cos 210°}{2}}$

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

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

$= -\sqrt{\frac{2-\sqrt{3}}{4}}$

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

+1 each method

+1 correct answer

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