Review: 5.2 and 5.3
Odd/even, cofunctions, composite argument properties

Part D: Prove that each of the following is an identity. Plug the left side in the ~~sum/difference~~ composite argument formulas and simplify.

19. $\sin(\theta + 60°) - \cos(\theta + 30°) = \sin\theta$

$[\sin\theta \cdot \cos 60 + \cos\theta \cdot \sin 60] - [\cos\theta \cdot \cos 30 - \sin\theta \cdot \sin 30]$

$\frac{1}{2}\sin\theta + \frac{\sqrt{3}}{2}\cos\theta - [\frac{\sqrt{3}}{2}\cos\theta - \frac{1}{2}\sin\theta]$

$\frac{1}{2}\sin\theta + \cancel{\frac{\sqrt{3}}{2}\cos\theta} - \cancel{\frac{\sqrt{3}}{2}\cos\theta} + \frac{1}{2}\sin\theta$

$\sin\theta$

20. $\sin(\theta + 30°) + \cos(\theta + 60°) = \cos\theta$

$(\sin\theta \cdot \cos 30 + \cos\theta \cdot \sin 30) + (\cos\theta \cdot \cos 60 - \sin\theta \cdot \sin 60)$

$\cancel{\frac{\sqrt{3}}{2}\sin\theta} + \frac{1}{2}\cos\theta + \frac{1}{2}\cos\theta - \cancel{\frac{\sqrt{3}}{2}\sin\theta}$

$\cos\theta$

Part E: Simplify using composite argument properties.

21. $\sin\left(\frac{3x}{7}\right)\cos\left(\frac{4x}{7}\right) + \cos\left(\frac{3x}{7}\right)\sin\left(\frac{4x}{7}\right)$

$\sin\left(\frac{3x}{7} + \frac{4x}{7}\right)$

$\underline{\sin x}$

22. $\cos 65°\cos 20° + \sin 65°\sin 20°$

$\cos(65 - 20)$

$\cos 45$

$\frac{\sqrt{2}}{2}$

Part F: Using only angles from special right triangles, rewrite the following as a sum or difference of two angles. Then find the **exact** value using the ~~sum or difference.~~ composite argument

23. $\cos 75° = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\cos(45 + 30)$

$\cos 45 \cdot \cos 30 - \sin 45 \cdot \sin 30$

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

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

24. $\sin 15° = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\sin(45 - 30)$

$\sin 45 \cdot \cos 30 - \cos 45 \cdot \sin 30$

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

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

25. $\tan 105° = \frac{1 + \sqrt{3}}{1 - \sqrt{3}}$

$\tan(60 + 45)$

$\frac{\tan 60 + \tan 45}{1 - \tan 60 \cdot \tan 45}$

$\frac{\sqrt{3} + 1}{1 - \sqrt{3}}$

26. $\cos 285° = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\cos(150 + 135)$

$\cos 150 \cdot \cos 135 - \sin 150 \cdot \sin 135$

$-\frac{\sqrt{3}}{2} \cdot -\frac{\sqrt{2}}{2} - [\frac{1}{2} \cdot \frac{\sqrt{2}}{2}]$

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

27. $\sin\frac{5\pi}{12} = \frac{\sqrt{6} + \sqrt{2}}{4}$

$\sin\left(\frac{3\pi}{12} + \frac{2\pi}{12}\right)$

$\sin\left(\frac{\pi}{4} + \frac{\pi}{6}\right)$

$\sin\frac{\pi}{4} \cdot \cos\frac{\pi}{6} + \cos\frac{\pi}{4} \cdot \sin\frac{\pi}{6}$

$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$

28. $\tan\frac{11\pi}{12} = \frac{-3 + \sqrt{3}}{3 + \sqrt{3}}$

$\tan\left(\frac{9\pi}{12} + \frac{2\pi}{12}\right)$ $\tan\left(\frac{3\pi}{4} + \frac{\pi}{6}\right)$

$\frac{\tan\frac{3\pi}{4} + \tan\frac{\pi}{6}}{1 - \tan\frac{3\pi}{4} \cdot \tan\frac{\pi}{6}}$ $\frac{-1 + \frac{\sqrt{3}}{3}}{1 + 1\left(\frac{\sqrt{3}}{3}\right)}$ $\frac{-1 + \frac{\sqrt{3}}{3}}{1 + \frac{\sqrt{3}}{3}}$

$\frac{-\frac{3}{3} + \frac{\sqrt{3}}{3}}{\frac{3}{3} + \frac{\sqrt{3}}{3}}$ $\frac{\frac{-3 + \sqrt{3}}{3}}{\frac{3 + \sqrt{3}}{3}}$ $\frac{-3 + \sqrt{3}}{3 + \sqrt{3}}$

Review: 5.2 and 5.3
Odd/even, cofunctions, composite argument properties

Part A: Use the odd / even properties to rewrite each with positive arguments.
Recall: $\sin(-x) = -\sin x; \cos(-x) = \cos x; \tan(-x) = -\tan x$

1. $\sin(-13)^\circ =$ $-\sin(13)$
2. $\cos\left(-\frac{\pi}{6}\right) =$ $\cos\left(\frac{\pi}{6}\right)$
3. $\tan(-135^\circ) =$ $-\tan(135)$
4. $\sec(-\pi) =$ $\sec(\pi)$
5. $-\sec(-73^\circ) =$ $-\sec(73)$
6. $-\tan\left(-\frac{\pi}{5}\right) =$ $\tan\left(\frac{\pi}{5}\right)$
7. $-\sin(-305^\circ) =$ $\sin(305)$
8. $-\cos\left(-\frac{\pi}{3}\right) =$ $-\cos\left(\frac{\pi}{3}\right)$

Part B: Use the cofunction properties to rewrite the following: (pos. arguments)

9. $\sin 25^\circ =$ $\cos(65)$
10. $\sec 12^\circ =$ $\csc(78)$
11. $\tan 88^\circ =$ $\cot(2)$
12. $\csc 46^\circ =$ $\sec(44)$
13. $\cot 13^\circ =$ $\tan(77)$
14. $\cos 90^\circ =$ $\sin(0)$
15. $\sin\frac{\pi}{4} =$ $\cos\left(\frac{\pi}{4}\right)$
16. $\cos\frac{2\pi}{3} =$ $\sin\left(-\frac{\pi}{6}\right)$

$\frac{\pi}{2} - \frac{2\pi}{3}$

$\frac{3\pi}{6} - \frac{4\pi}{6}$

Part C: If α and β are the measures of two first quadrant angles, find the exact value of each function.

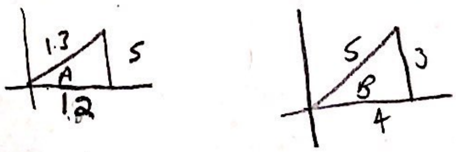
17. If $\sin A = \frac{8}{17}$ and $\tan B = \frac{7}{24}$, find $\cos(A - B)$

$\cos A \cdot \cos B + \sin A \cdot \sin B$

$\frac{15}{17} \cdot \frac{24}{25} + \frac{8}{17} \cdot \frac{7}{25}$

$\frac{360}{425} + \frac{56}{425}$

$\frac{416}{425}$



18. If $\csc A = \frac{13}{5}$ and $\tan B = \frac{3}{4}$, find $\sin(A + B)$

$\sin A \cdot \cos B + \cos A \cdot \sin B$

$\left(\frac{5}{13}\right)\left(\frac{4}{5}\right) + \left(\frac{12}{13}\right)\left(\frac{3}{5}\right)$

$\frac{20}{65} + \frac{36}{65}$

$\frac{56}{65}$