

- 1) What's the Pythagorean identity? and ~~show~~ show how to get the other 2 forms of it.
- 2) What's $\sin(A+B)$ and $\cos(A+B)$? and show how to get $\sin(2\theta)$ and $\cos(2\theta)$
- 3) Show how to get the other 2 forms of $\cos(2\theta)$
- 4) show how to get $\sin(\frac{\theta}{2})$ and $\cos(\frac{\theta}{2})$

Find

5) $\sin[\cos^{-1}(\frac{1}{2})]$ 6) $\cos[\tan^{-1}(\frac{\sqrt{3}}{3})]$ 7) $\tan[\sin^{-1}(\frac{\sqrt{3}}{2})]$ 8) $\cot[\cos^{-1}(-\frac{\sqrt{3}}{2})]$

9) $\sec[\sin^{-1}(-\frac{\sqrt{2}}{2})]$ 10) $\csc[\tan^{-1}(-\sqrt{3})]$ 11) $\sin(\frac{5\pi}{12})$ 12) $\cos(\frac{11}{12}\pi)$

13) If $\sec\theta = 3$ and $\sin\theta > 0$, find a) $\sin(2\theta)$ b) $\cos(\frac{\theta}{2})$

14) If $\tan\theta = \frac{4}{3}$ and $\pi < \theta < \frac{3\pi}{2}$ find a) $\cos(2\theta)$ b) $\sin(\frac{\theta}{2})$

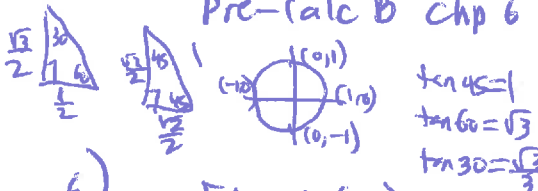
Solve

15) $\sin(3\theta + \frac{\pi}{18}) = 1$ 16) $2\sin^2\theta - 3\sin\theta + 1 = 0$

17) $3\cos\theta + 3 = 2\sin^2\theta$ 18) $\cos(2\theta) + 3 = 5\cos\theta$

Pre-calc B Chp 6 solutions (please double check my work)

#1-4 see notes



$\tan 45 = 1$
 $\tan 60 = \sqrt{3}$
 $\tan 30 = \frac{\sqrt{3}}{3}$

5) $\sin[\cos^{-1}(\frac{1}{2})]$
 $\sin[60]$
 $= \frac{\sqrt{3}}{2}$

6) $\cos[\tan^{-1}(\frac{\sqrt{3}}{3})]$
 $\cos(30) = \frac{\sqrt{3}}{2}$

7) $\tan[\sin^{-1}(\frac{\sqrt{3}}{2})]$
 $\tan(60) = \sqrt{3}$

8) $\cot[\cos^{-1}(-\frac{\sqrt{3}}{2})]$
 $\cot[180-30]$
 $\cot(150) = -\sqrt{3}$
 2nd quad

9) $\sec[\sin^{-1}(-\frac{\sqrt{2}}{2})]$
 $\sec[-45]$
 $\frac{1}{\cos(-45)} = \frac{1}{\frac{\sqrt{2}}{2}} = \sqrt{2}$
 IV quad

10) $\csc[\tan^{-1}(-\sqrt{3})]$
 $\csc[-60]$
 $\frac{1}{\sin(-60)} = \frac{1}{-\frac{\sqrt{3}}{2}}$
 $= -\frac{2\sqrt{3}}{3}$ IV quad

11) $\sin(\frac{5\pi}{12} \cdot \frac{180}{\pi})$
 $\sin(75^\circ)$
 $\sin(45+30) = \sin 45 \cos 30 + \sin 30 \cos 45$
 $= \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$
 $= \frac{\sqrt{6} + \sqrt{2}}{4}$

12) $\cos(165^\circ)$
 $= \cos(120+45)$
 $= \cos 120 \cos 45 - \sin 120 \sin 45$
 $= -\frac{1}{2} \cdot \frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2}$
 $= -\frac{\sqrt{2} + \sqrt{6}}{4}$

13) If $\sec \theta = 3$ then $\cos \theta = \frac{1}{3}$
 $(\frac{1}{3})^2 + \sin^2 \theta = 1$
 $\sin^2 \theta = \frac{8}{9}$
 $\sin \theta = \frac{2\sqrt{2}}{3}$

14) $\tan \theta = \frac{4}{3}$ III (-1,-1)
 $\tan^2 \theta + 1 = \sec^2 \theta$
 $\frac{16}{9} + 1 = \sec^2 \theta$
 $\sec \theta = -\frac{5}{3}$
 $\cos \theta = -\frac{3}{5}$ $\sin \theta = -\frac{4}{5}$

a) $\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$
 $= (-\frac{3}{5})^2 - (-\frac{4}{5})^2$
 $= \frac{9}{25} - \frac{16}{25} = -\frac{7}{25}$

a) $\sin(2\theta) = 2 \sin \theta \cos \theta$
 $= 2(\frac{2\sqrt{2}}{3})(\frac{1}{3}) = \frac{4\sqrt{2}}{9}$
 b) $\cos(\frac{\theta}{2}) = \pm \sqrt{\frac{1+\cos \theta}{2}}$
 $= \sqrt{\frac{1+\frac{1}{3}}{2}} = \sqrt{\frac{2}{3}} = \frac{\sqrt{6}}{3}$

15) $\sin(\) = 1$ (90°) = 1
 $3\theta + \frac{\pi}{18} = 90^\circ$
 $3\theta + 10^\circ = 90$
 $\frac{3\theta}{3} = \frac{80}{3}$
 $\theta = \frac{80}{3} \cdot \frac{\pi}{180} = \frac{4}{27} \pi$

b) $\sin \frac{\theta}{2} = \sqrt{\frac{1-\cos \theta}{2}} = \sqrt{\frac{1-\frac{3}{5}}{2}} = \sqrt{\frac{1}{5}} = \frac{1}{\sqrt{5}}$
 16) $(2\sin \theta - 1)(\sin \theta - 1) = 0$
 $\sin \theta = \frac{1}{2}$ $\sin \theta = 1$
 $\theta = 30 = \frac{\pi}{6}, 150 = \frac{5\pi}{6}, 90 = \frac{\pi}{2}$

17) $3 \cos \theta + 3 = 2 \sin^2 \theta$ (replace w/ $1-\cos^2 \theta$)
 $3 \cos \theta + 3 = 2(1-\cos^2 \theta)$
 $3 \cos \theta + 3 = 2 - 2 \cos^2 \theta$
 $2 \cos^2 \theta + 3 \cos \theta + 1 = 0$
 $(2 \cos \theta + 1)(\cos \theta + 1) = 0$
 $\cos \theta = -\frac{1}{2}$ $\cos \theta = -1$
 $\frac{120}{II}$ $\frac{240}{III}$
 $\theta = 120 = \frac{2\pi}{3}$
 $\theta = 240 = \frac{4\pi}{3}$
 $\theta = 180 = \pi$

18) $\cos(2\theta) + 3 = 5 \cos \theta$
 replace w/ $2\cos^2 \theta - 1$
 $2\cos^2 \theta - 1 + 3 = 5 \cos \theta$
 $2\cos^2 \theta - 5 \cos \theta + 2 = 0$
 $(2\cos \theta - 1)(\cos \theta - 2) = 0$
 $\cos \theta = \frac{1}{2}$ $\cos \theta = 2$
 $\frac{60}{I}$ $\frac{300}{IV}$ ϕ can't be 2
 $\theta = 60 = \frac{\pi}{3}$
 $\theta = 300 = \frac{5\pi}{3}$