

Problem Set 21

- Graph the function $f(x) = -2\cos x + 1$ on the interval $[-2\pi, 2\pi]$.
- Graph the function $f(x) = 2 - \frac{1}{2}\sin x$ on the interval $[-2\pi, 2\pi]$.
- Find the exact value for each of the following expressions.
 - $2\sin 75^\circ \cos 75^\circ =$
 - $\sin 112.5^\circ =$
- Prove each of the following identities.
 - $\frac{\sin 3x}{\sin x} - \frac{\cos 3x}{\cos x} = 2$
 - $\cos^4 x = \frac{3}{8} + \frac{1}{2}\cos 2x + \frac{1}{8}\cos 4x$
- Solve each of the following equations. Present exact values, in radians.
 - $\cos 2x - 4\cos x = 5$
 - $\sin x + \cos x = -1$
 - $2\cos x - \sin x + \sin 2x = 1$
 - $\sin 5x = -\frac{\sqrt{3}}{2}$
- Express each of the following as a sum or difference:
 - $\sin 40^\circ \cos 30^\circ =$
 - $\cos 50^\circ \cos 35^\circ =$
 - $\cos 110^\circ \sin 55^\circ =$
- Express each of the following as a product:
 - $\sin 50^\circ + \sin 40^\circ =$
 - $\sin 70^\circ - \sin 20^\circ =$
 - $\cos 55^\circ + \cos 25^\circ =$
- Find $\tan y$ if we know that $\tan x = 3$ and $\tan(x + y) = 8$.
- Let $\underline{u} = 8\underline{i} - 3\underline{j}$ and $\underline{v} = 8\underline{i} + 3\underline{j}$. Find each of the following.
 - $\underline{u} + \underline{v}$
 - $\underline{u} - \underline{v}$
 - $8\underline{u} - \underline{v}$
- Solve each of the following triangles.
 - $a = 22, b = 12, \alpha = 42^\circ$
 - $a = 15, b = 25, \alpha = 85^\circ$
 - $a = 12, b = 31, \alpha = 21^\circ$