

## Math 2001    September 7, 2006    Trig Fun

From your text, try P5 # 39, 41, 45, 47, 51\*, 55, 57\*, 59 (\* means more interesting than usual)

Find the exact value for the following:

1.  $\sin(45^\circ + 30^\circ)$
2.  $\sin(15^\circ)$
3. Verify that  $\sin x = \csc x - \cos x \cot x$
4. Graph  $y = \sin(2x) + 1$
5. Given that  $\sin x = \frac{5}{6}$ , and angle  $x$  is in quadrant 1, find the value for the other 5 trig functions.
6. Given a triangle with  $a = 13$ ,  $b = 10$ , and  $A = 33$  degrees, solve the triangle.
7. Given a triangle with  $a = 12.3$ ,  $b = 5.13$ , and  $C = 58$  degrees, solve the triangle.
- 8\*. Given a triangle with sides 1200 ft., 390 ft., and 850 ft., what is the area of the triangle?.

### Trigonometric Identities

$$\cos(a + b) = \cos a \cos b - \sin a \sin b$$

$$\sin(a + b) = \sin a \cos b + \cos a \sin b$$

$$\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$$

$$\sin(2a) = 2 \sin a \cos a$$

$$\tan(2a) = \frac{2 \tan a}{1 - \tan^2 a}$$

$$\sin^2 a = \frac{1 - \cos 2a}{2}$$

$$\tan \frac{a}{2} = \frac{\sin a}{1 + \cos a} = \frac{1 - \cos a}{\sin a}$$

$$\text{law of sines: } \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\text{law of cosines: } c^2 = a^2 + b^2 - 2ab \cos C$$

$$\cos(a - b) = \cos a \cos b + \sin a \sin b$$

$$\sin(a - b) = \sin a \cos b - \cos a \sin b$$

$$\cos(2a) = \cos^2 a - \sin^2 a = 1 - 2 \sin^2 a = 2 \cos^2 a - 1$$

$$\cos^2 a = \frac{1 + \cos 2a}{2}$$