ch 6.1 pg 298

17. Determine an expression for m that makes $\dfrac{2 - \cos^2 x}{\sin x} = m + \sin x$ an identity.

- can we rearrange the LHS so that it will have "something" + sinx

- common factor
- expand
- collect like terms
- multiply by fancy 1
- substitution
- break up terms

$$\frac{1+(1-\cos^2 x)}{\sin x}$$

ooohh....

$\sin^2\theta + \cos^2\theta = 1$

$\sin^2\theta = 1-\cos^2\theta$

$$\frac{1+\sin^2 x}{\sin x}$$

$$\frac{1}{\sin x} + \frac{\sin^2 x}{\sin x}$$

$$\frac{1}{\sin x} + \sin x = \text{"something"} + \sin x$$

$\therefore\ m = \dfrac{1}{\sin x} = \csc x$

18. What value of k makes the equation
$\sin 5x \cos x + \cos 5x \sin x = 2 \sin kx \cos kx$
true?

Simplify LHS so it looks similar to RHS...

$\sin 5x \cos x + \cos 5x \sin x$ let $A = 5x$, $B = x$

- RHS looks like $\sin 2A = 2 \sin A \cos A$

$= \sin A \cos B + \cos A \sin B$

$= \sin(A + B)$

$= \sin(5x + x)$

$= \sin(6x)$

$= \sin[2(3x)]$

$= 2 \sin 3x \cos 3x$

$\therefore k = 3$

20. If $\angle A$ and $\angle B$ are both in quadrant I, and $\sin A = \frac{4}{5}$ and $\cos B = \frac{12}{13}$, evaluate each of the following,

a) $\cos(A - B) = \cos A \cos B + \sin A \sin B$

$= \cos A \left(\frac{12}{13}\right) + \left(\frac{4}{5}\right)\sin B$

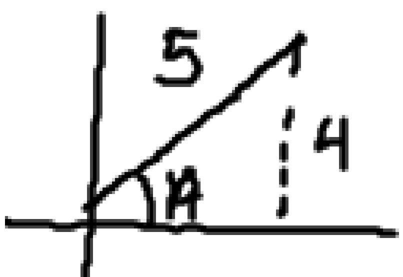
– need to find cos A and sin B

$\underline{\angle A}$

$\sin A = \frac{4}{5} \left(\frac{OPP}{HYP}\right)$

$\cos A = \frac{ADJ}{HYP}$

$\cos A = \frac{3}{5}$



find ADJ : Pythag. Thm

$a^2 + b^2 = c^2$

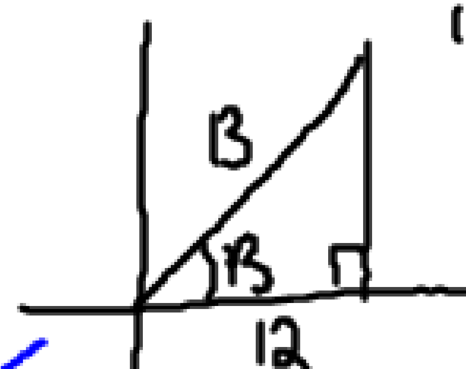
Pythag. Triple

3–4–5

$\underline{\angle B}$

$\cos B = \frac{12}{13} \left(\frac{ADJ}{HYP}\right)$

5-12-13



$a^2 + b^2 = c^2$

$12^2 + b^2 = 13^2$

$b^2 = 169 - 144$

$b^2 = 25$

$b = 5$

$\sin B = \frac{5}{13}$

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

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

$$\begin{array}{r} \overset{1}{13} \\ \times\ 5 \\ \hline 65 \end{array}$$

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

$$= \frac{56}{65}$$

factoring using strategies from ch 3 ☺

Factoring

$\tan^2 x - \sin^2 x$

diff of squares

$(\tan x + \sin x)(\tan x - \sin x)$

$\tan^2 x + \tan x \sin^2 x$

common factor

$\tan x(\tan x + \sin^2 x)$

$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$\cos^3 x + \sin^3 x$ sum of cubes

$(\cos x + \sin x)(\cos^2 x - \cos x \sin x + \sin^2 x)$

$\cos^2\theta + \sin^2\theta = 1$

$(\cos x + \sin x)(1 - \cos x \sin x)$

To work on in class and have understanding of by Thursday:

pg 307#19, 20,21, sheet