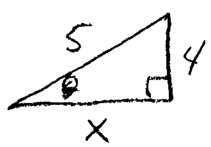
BE-Alg. 2 | TUESDAY 2-9-10

① Find the $\cos\theta$ if $\sin\theta = \frac{4}{5}$
And $90° < \theta < 180°$.

② Simplify $(-2c)^3$

③ Simplify $(7x^3y^{-5})(4xy^3)$

ANS

① 

$\therefore\ 5^2 - 4^2 = x^2$
$3 = x$

$\therefore\ \cos\theta = \frac{3}{5}$, QII $\Rightarrow \boxed{\cos\theta = -\frac{3}{5}}$

② $-2^3c^3 = \boxed{-8c^3}$

③ $28x^4y^{-2} = \boxed{\dfrac{28x^4}{y^2}}$

Lesson 14-3

Homework Review Pg. 860 # 13-18

(13) $\csc^2\theta - \cot^2\theta$

$\csc^2\theta - [\csc^2\theta - 1]$

$$\frac{\sin^2\theta}{\sin^2\theta} + \frac{\cos^2\theta}{\sin^2\theta} = \frac{1}{\sin^2\theta}$$

$$\cot^2\theta = \csc^2\theta - 1$$

$\csc^2\theta - \csc^2\theta + 1 = \boxed{1}$

(14) $\sin\theta \tan\theta \csc\theta$

$\sin\theta \cdot \frac{\sin\theta}{\cos\theta} \cdot \frac{1}{\sin\theta} = \boxed{\tan\theta}$

(15) $\tan\theta \csc\theta$

$\frac{\sin\theta}{\cos\theta} \cdot \frac{1}{\sin\theta} = \frac{1}{\cos\theta} = \boxed{\sec\theta}$

(16) $\sec\theta \cot\theta \cos\theta$

$\frac{1}{\cancel{\cos}\theta} \cdot \frac{\cos\theta}{\sin\theta} \cdot \cancel{\cos}\theta = \boxed{\cot\theta}$

(17.) $\cos\theta\,(1-\cos^2\theta)$

$\boxed{\cos\theta\,(\sin^2\theta)}$

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

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

(18) $\dfrac{1-\sin^2\theta}{\cos^2\theta} = \dfrac{\cos^2\theta}{\cos^2\theta} = \boxed{1}$

Ch. 14-4 Verifying Trig. Identities
(Showing a trig. identity is true)

This is slightly different from simplifying trig. identities, but only because your goal is different. You do not necessarily have to get both sides of the equation into simplist form (actually, very often you won't). You just need to show the two sides are equal... or not! In which case the identity is false.

You may choose one side or the other to work on, often you will need to change both sides.

I like to use and recommend a 2 column approach. Lets try Ex 3, Pg 783:

Verify $\sec^2\theta - \tan^2\theta = \tan\theta\cot\theta$

$\sec^2\theta - \tan^2\theta$

try a P.T. identity

$= \frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta} = \sec^2\theta$

$= \tan^2\theta + 1 - \tan^2\theta$

$= \boxed{1}$

UH OH, looks like the only way to prove this is to try to prove the Right side = 1

$\tan\theta\cot\theta$

$= \frac{\sin\theta}{\cos\theta} \cdot \frac{\cos\theta}{\sin\theta}$

$= \frac{\sin\theta}{\sin\theta} \cdot \frac{\cos\theta}{\cos\theta}$

$= 1 \cdot 1 = \boxed{1}$ ✓

Ex1 Verify:

$$\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$$

P.T. identity

$$\frac{\sin^2\theta}{\cos^2\theta} + \frac{\cos^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta}$$

$$\therefore \tan^2\theta = \frac{1}{\cos^2\theta} - 1$$

$$\frac{1}{\cos^2\theta} - 1 - \sin^2\theta$$

same sign, ouch

$$\sec^2\theta - 1 = ? = \tan^2\theta$$

BACK TO STARTING POINT

TRY

$$\frac{\sin^2\theta}{\cos^2\theta} - \frac{\sin^2\theta}{1}$$

$$\frac{\sin^2\theta}{\cos^2\theta} - \frac{\sin^2\theta\cos^2\theta}{\cos^2\theta}$$

$$\frac{\sin^2\theta - \sin^2\theta\cos^2\theta}{\cos^2\theta}$$

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

$$\frac{\sin^2\theta(\sin^2\theta)}{\cos^2\theta} = \underbrace{\tan^2\theta\sin^2\theta}$$

NOTE, WE DON'T TRY TO simplify this side.

TIP

COMPLICATED → simple much easier than simple → COMPLICATED

This turns out to be the book solution, once you pick a starting point sometimes it is like jumping on a train — there is only ONE PATH. BUT — THERE ARE CERTAINLY OTHER WAYS TO DO THIS ONE.

HW: Pg 784 #5 → 8