

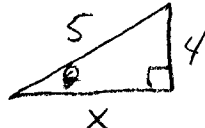
BE-Alg. 2 | TUESDAY 2-14-12

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

② Simplify $(-2c)^3$

③ Simplify $(7x^3y^{-5})(4xy^3)$

ANS

①  $\therefore 5^2 - 4^2 = x^2$ $\therefore \cos \theta = \frac{3}{5}$, $\text{QIII} \Rightarrow \boxed{\cos \theta = -\frac{3}{5}}$
 $3 = x$

② $-2^3c^3 = \boxed{-8c^3}$

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

Homework Review Pg. 860 # 13-18

$$\begin{aligned} \textcircled{13} \quad \csc^2 \theta - \cot^2 \theta & \left| \begin{array}{l} \frac{\sin^2 \theta + \cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta} \\ \cot^2 \theta = \csc^2 \theta - 1 \end{array} \right. \\ \csc^2 \theta - [\csc^2 \theta - 1] & \\ \csc^2 \theta - \csc^2 \theta + 1 & = \boxed{1} \end{aligned}$$

$$\textcircled{14} \quad \sin \theta \tan \theta \csc \theta$$

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

$$\textcircled{15} \quad \tan \theta \csc \theta$$

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

$$\textcircled{16} \quad \sec \theta \cot \theta \cos \theta$$

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

$$\textcircled{17.} \quad \cos \theta (1 - \cos^2 \theta)$$

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

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

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

$$\textcircled{18} \quad \frac{1 - \sin^2 \theta}{\cos^2 \theta} = \frac{\cos^2 \theta}{\cos^2 \theta} = \boxed{1}$$

3.

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 simplest form (actually, very often you want). 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. Let's try Ex 3, Pg 783:

CAUTION

Do not use undos!

You must work the left side and right side of the equals sign separately.

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

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

try a P.T. identity

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

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

$= 1$

uh oh, looks like the only way to prove this is to try to prove the right side = 1

$\tan \theta \cot \theta$

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

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

$= 1 \cdot 1 = 1$ ✓

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, each

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

BACK TO STARTING POINT

TRY

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

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

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

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

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

TIP

Complicated \rightarrow simple
much easier than
Simple \rightarrow 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 \rightarrow 8

NOTE, we don't try to simplify this side.