Today's assignment:

Identities Additional Practice #1-33 (due Friday, 10 points)

Complete as much as possible before the group quiz tomorrow so you are prepared for the assessment!!

Ch. 7 Identities Review

Show work!

1) Solve the following for x, in terms of π, where $0° \le x < 360°$

$$\sin x - 2\sin x \cos x = 0$$

factor

$$\sin x(1 - 2\cos x) = 0$$

$\sin x = 0$

use unit circle to solve

$\sin x = 0$

$x = 0°$, $180°$

$1 - 2\cos x = 0$

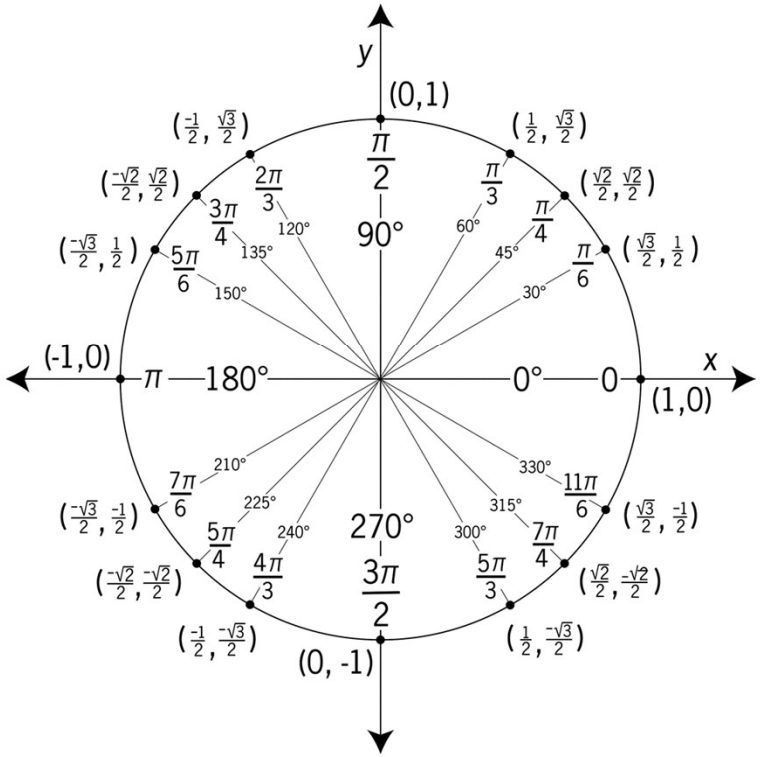
$-2\cos x = -1$

$\cos x = \frac{-1}{-2}$

$\cos x = \frac{1}{2}$

$x = 60°$, $300°$

No Calculator!



CHECK ANSWERS #1-9

0	0	0	30	45	60	60	60	90	120
120	120	135	180	210	240	240			
270	300	300	300	300	315	330			

Ch. 7 Identities Review **Show work!**

1) Solve the following for x, in terms of π, where $0 \le x < 360^\circ$

$$\sin x - 2 \sin x \cos x = 0$$

Identity:

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

substitute

2) Find *all* values of θ in the interval $0° \le \theta < 360°$ that satisfy the equation $\cos 2\theta - \cos\theta = 0$.

$$2\cos^2\theta - 1 - \cos\theta = 0 \xrightarrow{\text{rewrite}} 2\cos^2\theta - \cos\theta - 1 = 0$$

$$(2\cos\theta + 1)(\cos\theta - 1) = 0$$

now split apart & solve using zero product property as in problem #1

think $2x^2 \underbrace{-x}_{\text{add}} - 1 = 0$

$$(2x + 1)(x - 1) = 0$$

apply the algebra factors to the trig expression

Solve using degrees instead of radians.

Ch. 7 Identities Review **Show work!** NAME:

No Calculator!

1) Solve the following for x, in terms of π, where $0^\circ \le x < 360^\circ$

$\sin x - 2\sin x \cos x = 0$

2) Find *all* values of θ in the interval $0° \le \theta < 360°$ that satisfy the equation $\cos 2\theta - \cos\theta = 0$.

3) Find *all* values of θ in the interval $0° \le \theta < 360°$ that satisfy the equation $\sin 2\theta + \cos\theta = 0$.

4) If x is a positive acute angle, solve $6\tan x - 2\sqrt{3} = 0$ to the nearest degree.

5) If x is a positive acute angle, solve $4\sin x - 2\sqrt{2} = 0$ to the nearest degree.

6) Given $2\tan x + 2 = 0$, solve for x, to the nearest degree, in the interval $0 \le x < 360$.

7) Given $2\tan x + 2\sqrt{3} = 0$, solve for x, to the nearest degree, in the interval $0 \le x < 360$.

8) What are *all* values of θ in the interval $0° \le \theta < 360°$ that satisfy the equation $2\cos^2\theta - 3\cos\theta + 1 = 0$?

9) Find, to the nearest degree, the solution set of $4\cos^2 x - 1 = 0$ in the interval between $0°$ and $360°$.

10) Express $\cos^2\theta + \sin^2\theta + \tan^2\theta$ as a single trigonometric function.

11) Express $\dfrac{\cos^2\theta}{1-\cos^2\theta}$ as a single trigonometric function.

12) Express $\csc\theta - \cot\theta\cos\theta$ as a single trigonometric function.

13) Transform $\cos\theta\csc\theta\tan\theta - \sin^2\theta$ into an equivalent expression in terms of the trigonometric function $\cos\theta$.

19) The expression $\sec^2\theta + \csc^2\theta$ is equivalent to

A) $\sin^2\theta\cos^2\theta$ C) $\dfrac{1}{\sin^2\theta\cos^2\theta}$

B) $1 - \tan^2\theta$ D) $1 + \tan^2\theta$

20) The expression $\cos 70° \cos 10° + \sin 70° \sin 10°$ is equivalent to

A) $\sin 60°$ C) $\sin 80°$

B) $\cos 60°$ D) $\cos 80°$

21) The expression $\sin 50° \cos 40° + \cos 50° \sin 40°$ is equivalent to

A) $\cos 10°$ C) $\sin 90°$

B) $\cos 90°$ D) $\sin 10°$

22) Since $\sin 75° = \sin(30° + 45°)$, then $\sin 75°$ equals

A) $\dfrac{\sqrt{6}-\sqrt{2}}{4}$ C) $\dfrac{\sqrt{2}+\sqrt{6}}{4}$

B) $\dfrac{-\sqrt{2}-\sqrt{6}}{4}$ D) $\dfrac{-\sqrt{6}+\sqrt{2}}{4}$

23) The expression $\tan(180° - y)$ is equivalent to

A) $-\tan y$ C) $\dfrac{-\tan y}{1+\tan y}$

B) -1 D) $\dfrac{1-\tan y}{1+\tan y}$

24) The expression $\sec x \sin 2x$ is equivalent to

25) The expression $\dfrac{\sin 2A}{2\cos^2 A}$ is equivalent to

26) The expression $\dfrac{1+\cos 2x}{\sin 2x}$ is equivalent to

14) Simplify: $\tan^2\theta \cos^2\theta + \cos^2\theta$

15) If $\tan A = \frac{2}{3}$ and $\tan B = \frac{1}{2}$, what is the value of $\tan (A + B)$?

16) The expression $\frac{\sec\theta}{\tan\theta}$ is equivalent to

A) $\csc\theta$ C) $\sin\theta$
B) $\cos\theta$ D) $\sec\theta$

17) The expression $\sin\theta (\cot\theta - \csc\theta)$ is equivalent to

A) $-\sin\theta$ C) $\cos\theta - 1$
B) $\cos\theta - \sin^2\theta$ D) $2\cos\theta$

18) For all values of θ for which the expression is defined, $\frac{\sec\theta}{\csc\theta}$ is equivalent to

A) $\cot\theta$ C) $\cos\theta$
B) $\sin\theta$ D) $\tan\theta$

27) The expression $\cos 2A - \cos^2 A$ is equivalent to

28) If $\angle A$ and $\angle B$ are acute angles, $\sin A = \frac{4}{5}$, and $\cos B = \frac{5}{13}$, what is the value of $\sin (A + B)$?

29) If $\sin A = \frac{3}{5}$, find $\cos 2A$.

30) If $\cos\theta = -\frac{3}{5}$, find $\cos 2\theta$ and express in simplest form.

31) Find the value of $\tan 2A$ if $\tan A = -\sqrt{6}$.

32) If A is a positive acute angle and $\cos A = \frac{7}{9}$, find the value of $\sin\frac{A}{2}$.

33) If A is a positive acute angle and $\cos A = \frac{1}{5}$, find the value of $\cos\frac{A}{2}$.

CHECK ANSWERS #1-9

0 0 0 30 45 60 60 60 90 120
120 120 135 180 210 240 240
270 300 300 300 300 315 330

CHECK ANSWERS #10-15, 24-33

$\sin\theta$ $2\sin x$ $-\sin^2 A$ $\cos^2\theta$ $\frac{-7}{25}$ $\frac{7}{4}$ $\frac{7}{25}$ $\frac{1}{3}$
$\tan A$ $\sec^2\theta$ $\cot x$ $\cot^2\theta$ 1 $\frac{56}{65}$ $\frac{2\sqrt{6}}{5}$ $\frac{\sqrt{15}}{5}$

CHECK ANSWERS #16-23

A A B C C C C D

Check answers (blue sheet)

16. A
17. C
18. D
19. C
20. B
21. C
22. C
23. A

GROUP QUIZ: *tomorrow!*

→No calculator, no notes!

→Only the following identities will be provided on the test:

sum/difference, double angle, half angle

Prepare for upcoming quiz/test

***Quiz yourself: practice identities, unit circle.**

***No notes and no calculator for quiz & test.**

***Use handout #1-13 as a guide to study**

for the quiz and test *(same format, questions will be in a different order.)*

***Be ready to also simplify, factor, substitute, verify, solve for θ, etc…**

Identities *Practice*

✓CHECK ANSWERS

Name the function that best completes each statement.

Quotient Identities:

1. $\cot\theta = \dfrac{\cos\theta}{\sin\theta}$

2. $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$

memorize these identities!

Reciprocal identities:

3. $\cot\theta = \dfrac{1}{\tan\theta}$

4. $\sec\theta = \dfrac{1}{\cos\theta}$

5. $\csc\theta = \dfrac{1}{\sin\theta}$

6. $\sin\theta = \dfrac{1}{\csc\theta}$

7. $\tan\theta = \dfrac{1}{\cot\theta}$

8. $\cos\theta = \dfrac{1}{\sec\theta}$

Pythagorean identities:

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

memorize these identities!

#10-11: *Derive* the other two Pythagorean identities using the information in #9. Clearly show all steps.

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

divide

Simplify → $1+\cot^2\theta = \csc^2\theta$

See yellow sheet for the "derive" notes

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

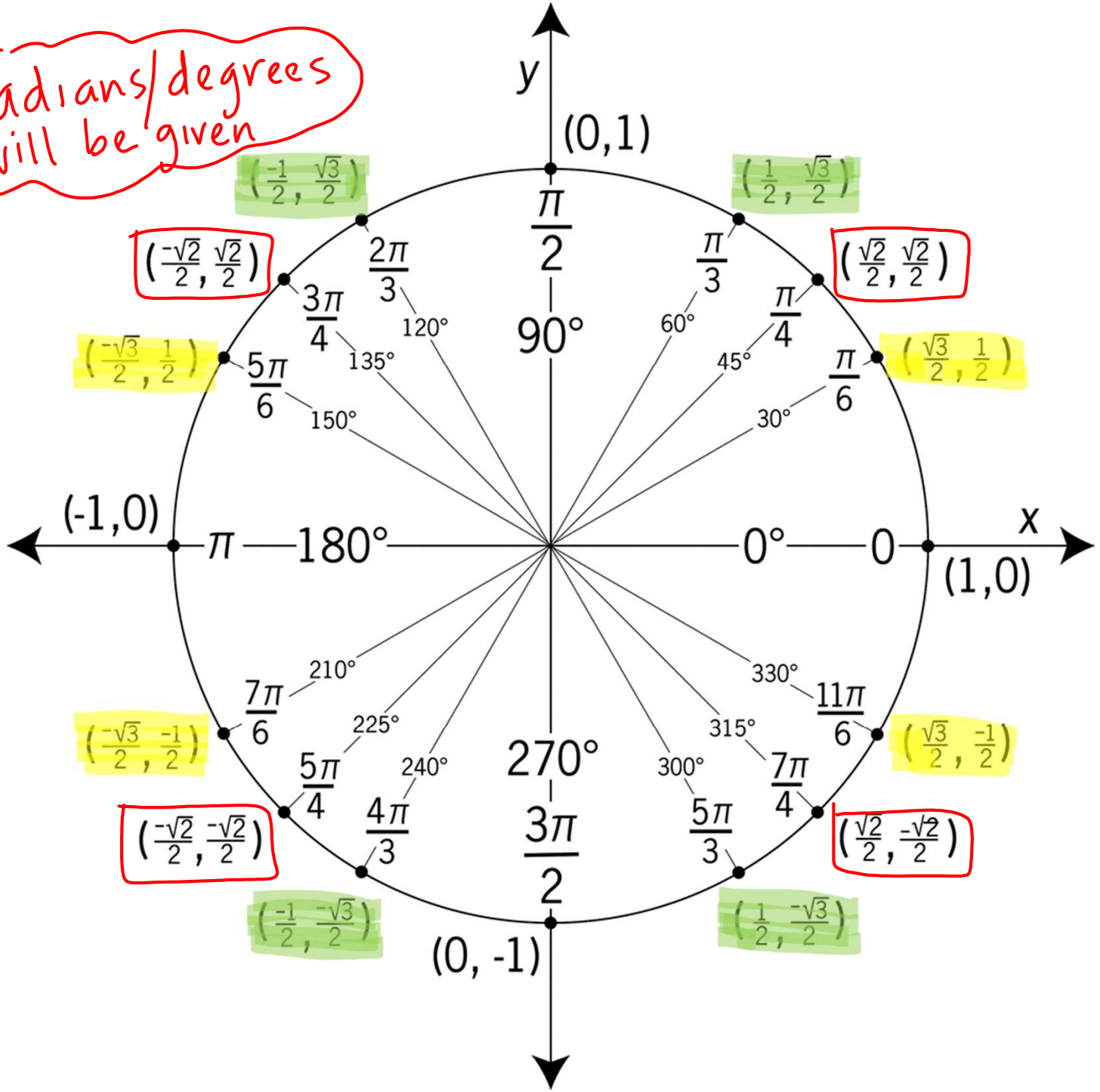
divide

→ $\tan^2\theta+1 = \sec^2\theta$

Simplify

12.

radians/degrees will be given



13. Define each function in terms of x and y (based on the unit circle with r = 1.)

$\sin\theta = y$ $\qquad$ $\csc\theta = \frac{1}{y}$

$\cos\theta = x$ $\qquad$ $\sec\theta = \frac{1}{x}$

$\tan\theta = \frac{y}{x}$ $\qquad$ $\cot\theta = \frac{x}{y}$