Lab on Identities

1. Theta (1 point)

Refer to lab page 2. Let angle CAD be represented as θ. What is angle C'A'D' ?

a. $-\theta$ b. $\theta + 45^o$ c. $\theta + 90^o$ d. 2θ

2. Match color (1 point)

Refer to lab page 2. Match the cyan, magenta, yellow, and green lines with the appropriate trig functions.

1. cyan a. sin 2θ
2. magenta b. cos θ
3. yellow c. sin θ
4. green d. cos 2θ

3. Animate (1 point)

Refer to lab page 2. Hit the Revolve D button and note what happens.

a. angle C'A'D' goes through one revolution, angle CAD goes through 2 revolutions

b. angle CAD goes through one revolution, angle C'A'D' goes through 2 revolutions

c. angle CAD spins and spins
d. angle CAD goes through half a revolution, angle C'A'D' goes through one revolution

e. angle CAD goes through one revolution, angle C'A'D' goes through half a revolution

4. Period (1 point)

Refer to lab page 2. What is the period of the function y=cos(2x) ?

a. $\pi/2$ b. π c. 2π d. 4π

5. Grapher zoom (1 point)

Refer to lab page 3. Use the utility to graph cos(2x). Now zoom in to find the x coordinate of the smallest positive x intercept. Answer accurate to three decimal places.

1. _____

6. Period of cos x^2 (1 point)

Refer to lab page 3. Refresh the grapher's display and plot $\cos(x)^2$ (the syntax for the grapher is cos(x)^2). What is the period of $\cos(x)^2$?

a. $\pi/2$ b. π c. 2π d. 4π

7. cos^2-sin^2 (1 point)

Refer to lab page 3. Now plot $\cos(x)^2 - \sin(x)^2$ in the other color. What fact about the new graph supports the fact that $\cos(2x) = \cos(x)^2 - \sin(x)^2$ is a trig identity?

a. The graph is identically 0

b. The graph is identically 1

c. The graph coincides with the graph of sin(2x)

d. The graph coincides with the graph of cos(2x)

e. The graph matches the graph of (cos(x)-sin(x))(cos(x)+sin(x))

8. Identity 1 (0.5 point)

Use the grapher on page 3. What right hand side f(x) makes $(\cos x)^2 (1 + (\tan x)^2) = f(x)$ an identity?

a. -1 b. 0 c. 1 d. $(\sin x)^2$ e. $(\cot x)^2$

9. Identity 2 (0.5 point)

Use the grapher on page 3. What right hand side f(x) makes $\sin(\pi/2 + x) = f(x)$ an identity?

a. sin x b. - sin x c. cos x d. -cos x e. $\pi/2$ + sin x f. $\pi/2$ + cos x

10. Identity 3 (0.5 point)

Use the grapher on page 3. What right hand side $f(x)$ makes $1 - (\cos x)^2/(1 + \sin x) = f(x)$ an identity?

a. -1 b. 0 c. 1 d. sin x e. cos x f. -sin x g. -cos x

11. Identity 4 (0.5 point)

Use the grapher on page 3. What right hand side $f(x)$ makes $(\cos x)^4 - (\sin x)^4 = f(x)$ an identity?

a. sin x b. cos x c. sin x/2 d. cos x/2 e. sin 2x f. cos 2x

12. Period variations (1 point)

Use the grapher on page 3. For a between -10 and 10 there are three values of a in the list below for which $\sin x = \cos(x - a)$. What are they?

a. -7.28 b. -4.66 c. -2.72 d. 1.553 e. 1.784 f. 3.143 g. 6.286 h. 7.864