



1. Suppose

$$x^2 + y^2 = 1$$

is a known identity. Determine if, under such assumption, the following is an identity

☐ A NOT an identity

☐ B YES, identity

$$2x^5 + 3y^4 = 2x^5$$

2. Suppose

$$x^2 + y^2 = 1$$

is a known identity. Determine if, under such assumption, the following is an identity

☐ A NOT an identity

☐ B YES, identity

$$x^6 + 2y^6 = -x^6 + 6x^4 - 6x^2 + 2$$

3.

$$\sin(x)$$

☐ B

can be exchanged for

$$\cos\left(\frac{\pi}{4} - x\right)$$

☐ A

☐ C

$$-\sin(-x)$$

$$\cos\left(\frac{\pi}{2} + x\right)$$

4. Suppose

$$x^2 + 3 = 3x + 1$$

is a known identity. Determine if, under such assumption, the following is an identity

☐ A NOT an identity

☐ B YES, identity

$$2x^5 + 9x = 71x - 60$$

5. The famous identity:

$$\tan(x) = \frac{\sin(x)}{\cos(x)}$$

can be 'tweaked' to produce the following identity/ies:

○

○

☐ A  $\frac{\tan(x)}{\sin(x)} = \frac{1}{\cos(x)}$

☐ B  $\tan(3x) = \frac{\sin(3x)}{\cos(3x)}$

☐ C  $\tan^2(x) = \frac{\sin^2(x)}{\cos^2(x)}$

☐ D  $\frac{\cos(x)\tan(x)}{\sin(x)} = 1$

☐ E  $\tan(x)\cos(x) = \sin(x)$

☐ F  $\frac{1}{\tan(x)} = \frac{\cos(x)}{\sin(x)}$

☐ G  $\cos(x) = \frac{\sin(x)}{\tan(x)}$

☐ H none of these

6. The famous identity:

$$\sin(x) = \cos(90^\circ - x)$$

can be 'tweaked' to produce the following identity/ies:

○

○

☐ A  $\sin(45^\circ - t) = \cos[90^\circ - (45^\circ - t)]$

☐ B  $\sin(90^\circ - t) = \cos[90^\circ - (90^\circ - t)]$

☐ C  $\sin(90^\circ - t) = \cos(t)$

☐ D  $\sin(20^\circ - t) = \cos(70^\circ + t)$

☐ E  $\sin(\text{blah}) = \cos(90^\circ - \text{blah})$

☐ F  $\sin(\theta) = \cos(90^\circ - \theta)$

☐ G none of these

7. Select Expressions Equivalent to

$$\sin(x)$$

D

$$\frac{1}{\frac{1}{\sin(x)}}$$

A

E

$$\frac{1}{\csc(x)}$$

$$\frac{\text{opp}}{\text{hyp}}$$

B

F

$$-\sin(-x)$$

$$\cot(90 - x)$$

C

G

$$\frac{1}{\sec\left(\frac{\pi}{2} - x\right)}$$

$$-\sin(x)$$

8. Select Expressions Equivalent to

$$\frac{1}{\frac{1}{\cos(x)}}$$

E

$$-\sin(-x)$$

A

F

$$\cos(x)$$

$$\frac{1}{\frac{1}{\sin(x)}}$$

B

G

$$-\sin(x)$$

$$\frac{\text{adj}}{\text{hyp}}$$

C

H

$$\frac{1}{\csc\left(\frac{\pi}{2} - x\right)}$$

$$\text{xTan}$$

D

I

$$\frac{1}{\sec(x)}$$

$$\text{xSec}$$

9.

$$\cos(x)$$

B

can be exchanged for

$$\sin\left(\frac{\pi}{2} - x\right)$$

A

C

$$\cos\left(x - \frac{\pi}{2}\right)$$

$$\cot(x) \cos(x)$$

10.

$$-\tan(\beta)$$

B

is interchangeable with

$$\tan(-\beta)$$

A

C

$$\sec(-\beta)$$

$$\sin(-\beta)$$

11.

Suppose

$$x^3 = 1$$

is a known identity. Determine if, under such assumption, the following is an identity

$$2x^6 + 3x = 3x + 2$$

☐ A YES, identity

☐ B NOT an identity

12. Suppose

$$2x^3 = x + 1$$

is a known identity. Determine if, under such assumption, the following is an identity

$$8x^9 - 6 = 3x^2 + \frac{7}{2}x - \frac{9}{2}$$

☐ A YES, identity

☐ B NOT an identity

13.

$$\tan(\alpha)$$

is interchangeable with

☐ A

$$\frac{1}{\cot(\alpha)}$$

☐ B

☐ C

$\frac{\text{opp}}{\text{hyp}}$

$$\sin(\alpha)$$

14. The famous identity:

$$\cot(x) = \tan(90^\circ - x)$$

can be 'tweaked' to produce the following identity/ies:

☐ A  $\cot(\theta) = \tan(90^\circ - \theta)$

☐ B  $\cot(45^\circ - t) = \tan(45^\circ + t)$

☐ C  $\cot(45^\circ - t) = \tan[90^\circ - (45^\circ - t)]$

☐ D  $\cot(90^\circ - t) = \tan[90^\circ - (90^\circ - t)]$

☐ E  $\cot(R) = \tan(90^\circ - R)$

☐ F  $\cot(90^\circ - t) = \tan(t)$

☐ G none of these

15. Picture yourself in a 'special' world where

$$c^2 + s^2 = 1$$

Under this assumption, select the true statement/s:

☐ A Every  $s^4$  can be 'exchanged' for  $s^2 - c^2 + c^4$

☐ B Every  $s^4$  can be 'exchanged' for  $(1 - c^2)^2$

☐ C Every  $s^4$  can be 'exchanged' for  $1 - 2c^2 + c^4$

☐ D none of these

16. Suppose

$$x^3 + 3 = 2x + 3$$

is a known identity. Determine if, under such assumption, the following is an identity

$$10x^5 + 7 = 40x + 7$$

☐ A NOT an identity

☐ B YES, identity

17. if

$$A(x) = B(x)$$

$B(x)$  ARE

is an IDENTITY then within the respective domain  $A(x)$  AND

☐ A interchangeable

☐ B NOT interchangeable

18.

Select Expressions Equivalent to

$$\cos(x)$$

C

$$\frac{1}{\sec(x)}$$

A

$$\tan(x)$$

D

$$\cos(-x)$$

B

$$\frac{\text{adj}}{\text{hyp}}$$

E

$$\cos(x)$$

19. Picture yourself in a 'special' world where

$$x = -x$$

Under this assumption, select the true statement/s:

A

Every  $x$  can be 'exchanged' for  $-x$

B

Every  $3x$  can be 'exchanged' for  $x$

C

Every  $2x$  can be 'exchanged' for 0

D

Every  $3x$  can be 'exchanged' for  $2x + x$

E

none of these

20. Select Expressions Equivalent to

$$\cos(x)$$

D

$$\frac{1}{\frac{\cos(x)}{\sin(x)}}$$

A

$$\frac{1}{\csc\left(\frac{\pi}{2} - x\right)}$$

E

$$\frac{1}{\sec(x)}$$

B

$$\cos(-x)$$

F

$$\cos(x)$$

C

$$\frac{1}{\frac{1}{\sin(x)}}$$

G

none of these

H

$$\frac{\text{adj}}{\text{hyp}}$$

21.

$$\cot(\gamma)$$

B

is interchangeable with

$$\tan\left(\frac{\pi}{2} - \gamma\right)$$

A

$$\cos\left(\frac{\pi}{2} - \gamma\right)$$

C

$$\tan(\gamma)$$

22. Select Expressions Equivalent to

$$-\sin(-x)$$

B

$$\frac{\text{adj}}{\text{hyp}}$$

A

$$\frac{1}{\cot(x)}$$

C

$$\frac{\sin(x)}{\cos(x)}$$

D

xSec

G

xCot

E

$$\frac{1}{\sec\left(\frac{\pi}{2} - x\right)}$$

H

$$\frac{1}{\frac{1}{\sin(x)}}$$

F

$$\sin(x)$$

I

$\frac{\text{opp}}{\text{hyp}}$

23. Select Expressions Equivalent to

$$\sin(x)$$

B

$$\frac{1}{\frac{1}{\sin(x)}}$$

☐ ☐

C

$$\frac{1}{\csc(x)}$$

A

$$-\sin(-x)$$

D

$\frac{\text{opp}}{\text{hyp}}$

24. The famous identity:

$$\cos(x) = \frac{1}{\sec(x)}$$

can be 'tweaked' to produce the following identity/ies:

☐ ☐

A

$$0 = 1 - \cos(x) \sec(x)$$

B

$$\cos(5\theta) = \frac{1}{\sec(5\theta)}$$

C

$$\sec(x) \cos(x) = 1$$

D

$$0 = \cos(x) \sec(x) - 1$$

E

$$\sec(x) = \frac{1}{\cos(x)}$$

F

$$1 = \cos(x) \sec(x)$$

G

none of these

25.

$$\cot(90^\circ - x)$$

can be exchanged for

☐ ☐

A

$$\cos\left(x - \frac{\pi}{2}\right)$$

B

$$\frac{\sin(x)}{\cos(x)}$$

C

$$\cos\left(\frac{\pi}{2} - x\right)$$

26. Select Expressions Equivalent to

$$\frac{1}{\sec(x)}$$

☐ ☐

A

$$\cos(x)$$

C

$$\frac{1}{\frac{1}{\sin(x)}}$$

D

xTan

E

$$\frac{1}{\cot(x)}$$

B

$$\cos(-x)$$

F

$$-\sin(x)$$

G

H

$$\frac{1}{\csc(x)}$$

xSec

I

noneofthese

27. Picture yourself in a 'special' world where

$$s^2 = \frac{1 - 2c}{2}$$

Under this assumption, select the true statement/s:

A Every  $2s^2$  can be 'exchanged' for  $1 - 2c$

B Every  $s^4$  can be 'exchanged' for  $\frac{1}{4}(1 - 4c + 4c^2)$

C none of these

28. if

$$A(x) = B(x)$$

is an IDENTITY then within the respective domain  $A(x)$  AND

$B(x)$  ARE

A interchangeable

B NOT interchangeable

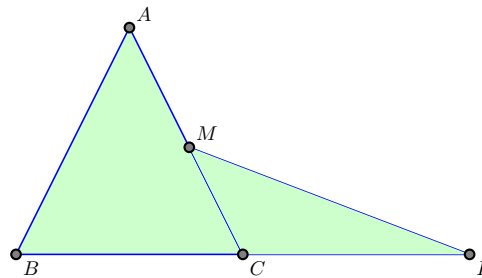
29. an equation is NOT an IDENTITY

A if it fails for SOME VALUE in its respective domain

B if it holds true for ALL VALUES of the respective domain

C always

30. Equilateral triangle  $\triangle ABC$  has side length 2, M is the midpoint of segment  $\overline{AC}$ , and C is the midpoint of  $\overline{BD}$ . What is the area of  $\triangle CDM$ ?



A  $\frac{\sqrt{2}}{2}$

B  $\frac{\sqrt{3}}{2}$

C  $\frac{5\pi}{3} - 3\sqrt{2}$

D  $\frac{3}{4}$

E  $\frac{8\pi}{3} - 2\sqrt{3}$

F  $\frac{8\pi}{3} - 3\sqrt{2}$

G none of these