Student: Cole Lamers **Date:** 07/17/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 6.2 Sum and Difference Formulas

1. Complete the following statement.

   $\sin(A+B) =$ __________

   Choose the correct answer below.

   - A. $\sin(A+B) = \cos A \cos B - \sin A \sin B$
   - B. $\sin(A+B) = \cos A \cos B + \sin A \sin B$
   - C. $\sin(A+B) = \sin A \cos B - \cos A \sin B$
   - D. $\sin(A+B) = \sin A \cos B + \cos A \sin B$

2. Complete the following statement.

   $\cos A \cos B - \sin A \sin B =$ __________

   Choose the correct answer below.

   - A. $\cos A \cos B - \sin A \sin B = \sin(A+B)$
   - B. $\cos A \cos B - \sin A \sin B = \cos(A+B)$
   - C. $\cos A \cos B - \sin A \sin B = \cos(A-B)$
   - D. $\cos A \cos B - \sin A \sin B = \sin(A-B)$

3. Complete the following statement.

   $\tan(A+B) =$ __________

   Choose the correct answer below.

   - A. $\tan(A+B) = \dfrac{\tan A - \tan B}{1 - \tan A \tan B}$
   - B. $\tan(A+B) = \dfrac{\tan A + \tan B}{1 + \tan A \tan B}$
   - C. $\tan(A+B) = \dfrac{\tan A - \tan B}{1 + \tan A \tan B}$
   - D. $\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$

4. True or False.

   $$\sin\left[\frac{\pi}{2} + x\right] = \cos x$$

   Choose the correct answer below.

   - A. True, because the value of the sine function of x is equal to the cosine of the supplement of x.
   - B. False, because the value of the sine function of x is equal to the cosecant of the supplement of x.
   - C. False, because the value of the sine function of x is equal to the tangent of the complement of x.
   - D. True, because the value of the sine function of x is equal to the cosine of the complement of x.

5. Use one or more of the six sum and difference identities to find the exact value of the expression.

   $\sin(30^\circ + 180^\circ)$

   $\sin(30^\circ + 180^\circ) = -\dfrac{1}{2}$

   (Type an exact answer, using radicals as needed. Simplify your answer.)

6. Use one or more of the six sum and difference identities to find the exact value of the expression.

$\sin(180^\circ - 30^\circ)$

$\sin(180^\circ - 30^\circ) = \frac{1}{2}$

(Type an exact answer, using radicals as needed. Simplify your answer.)

7. Use an identity to find the exact value of the expression.

$\sin\left(\frac{\pi}{6} + \frac{\pi}{4}\right)$

$\sin\left(\frac{\pi}{6} + \frac{\pi}{4}\right) = \frac{\sqrt{6} + \sqrt{2}}{4}$

(Type an exact answer, using radicals as needed. Rationalize all denominators.)

8. Find the exact value of the expression.

$\tan\left(\frac{\pi}{4} - \frac{\pi}{6}\right)$

$\tan\left(\frac{\pi}{4} - \frac{\pi}{6}\right) = 2 - \sqrt{3}$

(Simplify your answer. Type an exact answer, using radicals as needed. Rationalize all denominators.)

9. Use a cosine sum or difference identity to find the exact value.

$\cos\left(\frac{5\pi}{12}\right)$

$\cos\left(\frac{5\pi}{12}\right) = \frac{\sqrt{6} - \sqrt{2}}{4}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

10. Establish the identity $\sin\left(\frac{3\pi}{2} - \theta\right) = -\cos\theta$.

Which of the following four statements establishes the identity?

- A. $\sin\left(\frac{3\pi}{2} - \theta\right) = \sin\frac{3\pi}{2}\cos\theta - \cos\frac{3\pi}{2}\sin\theta = (-1)\cos\theta - (0)\sin\theta = -\cos\theta$
- B. $\sin\left(\frac{3\pi}{2} - \theta\right) = \sin\frac{3\pi}{2}\sin\theta + \cos\frac{3\pi}{2}\cos\theta = (-1)\cos\theta + (0)\sin\theta = -\cos\theta$
- C. $\sin\left(\frac{3\pi}{2} - \theta\right) = \sin\frac{3\pi}{2}\sin\theta - \cos\frac{3\pi}{2}\cos\theta = (0)\sin\theta - (-1)\cos\theta = -\cos\theta$
- D. $\sin\left(\frac{3\pi}{2} - \theta\right) = \sin\frac{3\pi}{2}\cos\theta + \cos\frac{3\pi}{2}\sin\theta = (-1)\cos\theta + (0)\sin\theta = -\cos\theta$

11. Verfiy the following identity.

$\cos(\pi - \theta) = -\cos\theta$

Which of the following four statements establishes the identity?

- A. $\cos(\pi - \theta) = \sin\pi\cos\theta - \cos\pi\sin\theta = -\cos\theta$
- B. $\cos(\pi - \theta) = \cos\pi\cos\theta + \sin\pi\sin\theta = -\cos\theta$
- C. $\cos(\pi - \theta) = \sin\pi\cos\theta + \cos\pi\sin\theta = -\cos\theta$
- D. $\cos(\pi - \theta) = \cos\pi\cos\theta - \sin\pi\sin\theta = -\cos\theta$

12. Establish the identity $\sin\left(\frac{3\pi}{2}+\theta\right) = -\cos\theta$.

Which of the following four statements establishes the identity?

- **A.** $\sin\left(\frac{3\pi}{2}+\theta\right) = \sin\frac{3\pi}{2}\cos\theta + \cos\frac{3\pi}{2}\sin\theta = (-1)\cos\theta + (0)\sin\theta = -\cos\theta$
- **B.** $\sin\left(\frac{3\pi}{2}+\theta\right) = \sin\frac{3\pi}{2}\cos\theta - \cos\frac{3\pi}{2}\sin\theta = (-1)\cos\theta - (0)\sin\theta = -\cos\theta$
- **C.** $\sin\left(\frac{3\pi}{2}+\theta\right) = \sin\frac{3\pi}{2}\sin\theta + \cos\frac{3\pi}{2}\cos\theta = (0)\sin\theta + (-1)\cos\theta = -\cos\theta$
- **D.** $\sin\left(\frac{3\pi}{2}+\theta\right) = \sin\frac{3\pi}{2}\sin\theta - \cos\frac{3\pi}{2}\cos\theta = (-1)\cos\theta - (0)\sin\theta = -\cos\theta$

13. Verify the identity.

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

To verify the identity, start with the more complicated side and transform it to look like the other side. Choose the correct transformations and transform the expression at each step.

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

$= \sin\left(\frac{\pi}{2} - \left((-x)\right)\right)$ Write the argument as a difference of two terms.

$= \cos(-x)$ Apply a cofunction identity.

$= \cos x$ Apply the appropriate even-odd identity.

14. Verfiy the following identity.

$$\cos\left(\theta+\frac{\pi}{2}\right) = -\sin\theta$$

Which of the following four statements establishes the identity?

- **A.** $\cos\left(\theta+\frac{\pi}{2}\right) = \cos\theta\cos\frac{\pi}{2} - \sin\theta\sin\frac{\pi}{2} = -\sin\theta$
- **B.** $\cos\left(\theta+\frac{\pi}{2}\right) = \sin\theta\cos\frac{\pi}{2} + \cos\theta\sin\frac{\pi}{2} = -\sin\theta$
- **C.** $\cos\left(\theta+\frac{\pi}{2}\right) = \sin\theta\cos\frac{\pi}{2} - \cos\theta\sin\frac{\pi}{2} = -\sin\theta$
- **D.** $\cos\left(\theta+\frac{\pi}{2}\right) = \cos\theta\cos\frac{\pi}{2} + \sin\theta\sin\frac{\pi}{2} = -\sin\theta$

15. Simplify the expression by using appropriate identities. Do not use a calculator.

$\sin(74^\circ)\cos(16^\circ) + \cos(74^\circ)\sin(16^\circ)$

$\sin(74^\circ)\cos(16^\circ) + \cos(74^\circ)\sin(16^\circ) =$ 1

16. Simplify the expression by using an appropriate identity. Do not use a calculator.

$(\cos 49^\circ)(\cos 41^\circ) - (\sin 49^\circ)(\sin 41^\circ)$

$(\cos 49^\circ)(\cos 41^\circ) - (\sin 49^\circ)(\sin 41^\circ) =$ 0

17. Find the exact value of the expression.

$$\cos 70^\circ \cos 20^\circ - \sin 70^\circ \sin 20^\circ$$

$\cos 70^\circ \cos 20^\circ - \sin 70^\circ \sin 20^\circ =$ 0

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

18. Find the exact value of the expression

$$\sin\frac{\pi}{4}\cos\frac{7\pi}{12}+\cos\frac{\pi}{4}\sin\frac{7\pi}{12}$$

$\sin\frac{\pi}{4}\cos\frac{7\pi}{12}+\cos\frac{\pi}{4}\sin\frac{7\pi}{12} = \frac{1}{2}$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

19. Watch the video and then solve the problem given below.

Click here to watch the video.[1]

Find the exact value of $\cos 68^\circ \cos 82^\circ - \sin 68^\circ \sin 82^\circ$.

$\cos 68^\circ \cos 82^\circ - \sin 68^\circ \sin 82^\circ = -\frac{\sqrt{3}}{2}$

(Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)

1: http://mediaplayer.pearsoncmg.com/assets/afSt9u5qCIPdgr7_rLk_c08SHtcQ33wW?clip=5

20. Watch the video and then solve the problem given below.

Click here to watch the video.[2]

Let $\cos u = \frac{4}{5}$ and $\sin v = -\frac{5}{13}$, with $\frac{3\pi}{2} < u < 2\pi$ and $\pi < v < \frac{3\pi}{2}$. Find the exact value of $\cos(u - v)$.

$\cos(u - v) = -\frac{33}{65}$ (Type an integer or a fraction.)

2: http://mediaplayer.pearsoncmg.com/assets/afSt9u5qCIPdgr7_rLk_c08SHtcQ33wW?clip=6