SHOW ALL WORK on a separate piece of paper, which will be collected at the end of the period. Credit will be given for WORK SHOWN.

1. Which is a trigonometric identity?

    a) $\sec u = \dfrac{1}{\cos u}$
                b) $\sin\left(\dfrac{\pi}{2}+u\right)=\sin u$

    c) $\tan^2 u + \cot^2 u = 1$
             d) $\sec u = \sin\dfrac{1}{u}$

2. Factor the expression and use the fundamental identities to simplify $\cos^2 x \sec^2 x - \cos^2 x$

    a) $\cos^2 x \cot^2 x$
                b) $\cos^2 x$

    c) 1
                   d) $\sin^2 x$

For #3 – 4, identify the expression that completes the equation so that it is an identity.

3. $\dfrac{1+\sec u}{\tan u} - \dfrac{\tan u}{1+\sec u} =$

    a) 0
                b) $2\sin u$

    c) $2+\cos u$
            d) $2\cot u$

4. $\dfrac{\cos x}{1+\sin x} =$

    a) $\dfrac{1-\sin x}{\cos x}$
            b) $\sin x$

    c) $\dfrac{1+\sec x}{\sec x}$
         d) $\dfrac{1+\csc x}{\csc x}$

For #5 – 6, identify the x-values that are solutions of the equation.

5. $5\sqrt{3}\tan x + 3 = 8\sqrt{3}\tan x$

    a) $x = \dfrac{\pi}{6}, x = \dfrac{11\pi}{6}$
       b) $x = \dfrac{7\pi}{6}, x = \dfrac{11\pi}{6}$

    c) $x = \dfrac{\pi}{6}, x = \dfrac{7\pi}{6}$
       d) $x = \dfrac{5\pi}{6}, x = \dfrac{11\pi}{6}$

6. $3\cot^2 x - 9 = 0$

    a) $\left\{\dfrac{\pi}{3},\dfrac{2\pi}{3},\dfrac{4\pi}{3},\dfrac{5\pi}{3}\right\}$
       b) $\left\{\dfrac{\pi}{4},\dfrac{3\pi}{4},\dfrac{5\pi}{4},\dfrac{7\pi}{4}\right\}$

    c) $\left\{\dfrac{\pi}{6},\dfrac{5\pi}{6},\dfrac{7\pi}{6},\dfrac{11\pi}{6}\right\}$
      d) $\left\{\dfrac{\pi}{4},\dfrac{\pi}{2},\dfrac{2\pi}{3},\dfrac{5\pi}{6}\right\}$

For #7 – 8, find all solutions of the equation in the interval $[0,2\pi)$.

7. $\sec^2 x + \tan x = 1$

    a) $\left\{0,\dfrac{3\pi}{4},\pi,\dfrac{7\pi}{4}\right\}$
       b) $\left\{\dfrac{2\pi}{3},\pi,\dfrac{4\pi}{3}\right\}$

    c) $\{0\}$
          d) $\left\{\dfrac{\pi}{4},\dfrac{3\pi}{4},\dfrac{5\pi}{4},\dfrac{7\pi}{4}\right\}$

8. $2\csc 3x - \dfrac{4}{3}\sqrt{3} = 0$

    a) $\left\{\dfrac{\pi}{9}, \dfrac{7\pi}{9}\right\}$

    b) $\left\{\dfrac{\pi}{9}, \dfrac{2\pi}{9}, \dfrac{\pi}{2}, \dfrac{7\pi}{9}, \dfrac{8\pi}{9}, \dfrac{13\pi}{9}, \dfrac{14\pi}{9}\right\}$

    c) $\left\{\dfrac{\pi}{9}, \dfrac{2\pi}{9}, \dfrac{7\pi}{9}, \dfrac{8\pi}{9}, \dfrac{13\pi}{9}\right\}$

    d) $\left\{\dfrac{\pi}{9}, \dfrac{2\pi}{9}, \dfrac{7\pi}{9}, \dfrac{8\pi}{9}, \dfrac{13\pi}{9}, \dfrac{14\pi}{9}\right\}$

9. $12\sin^2 x - 4\cos x - 11 = 0$

    a) $\left\{\arccos\dfrac{1}{6} = 1.4033, 2\pi - \arccos\dfrac{1}{6} = 4.8799, \dfrac{2\pi}{3}, \dfrac{4\pi}{3}\right\}$

    b) $\left\{\arccos(-6), \arccos(-6) + \pi, \dfrac{2\pi}{3}, \dfrac{4\pi}{3}\right\}$

    c) $\left\{\arccos(-6), \arccos(-6) + \pi, \dfrac{\pi}{3}, \dfrac{5\pi}{3}\right\}$

    d) $\left\{\arccos\dfrac{1}{6} = 1.4033, 2\pi - \arccos\dfrac{1}{6} = 4.8799, \dfrac{\pi}{3}, \dfrac{5\pi}{3}\right\}$

10. Find the exact value of $\cos 285°$.

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

    b) $\dfrac{\sqrt{6} + \sqrt{2}}{4}$

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

    d) $\dfrac{-\sqrt{2} - \sqrt{6}}{4}$

11. Identify the expression that completes the identity $\cos\left(\dfrac{\pi}{4} - x\right) =$

    a) $\dfrac{\sqrt{2}}{2}(\cos x - \sin x)$

    b) $\dfrac{\sqrt{2}}{2}(\sin x - \cos x)$

    c) $-\dfrac{\sqrt{2}}{2}(\cos x + \sin x)$

    d) $\dfrac{\sqrt{2}}{2}(\cos x + \sin x)$

12. Find the exact value of $\cos 2x$ using the double angle formula.

$\cos x = -\dfrac{2}{13}; \quad \dfrac{\pi}{2} < x < \pi$
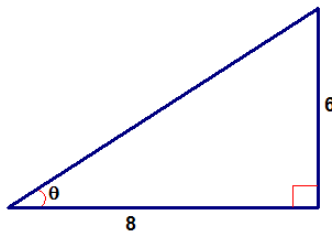
    a) $-\dfrac{161}{169}$

    b) $\dfrac{4\sqrt{165}}{169}$

    c) $\dfrac{161}{169}$

    d) $-\dfrac{4\sqrt{165}}{169}$

13. Use the figure to find the exact value of the trigonometric function $\cot\dfrac{\theta}{2}$

    a) $\dfrac{\sqrt{10}}{10}$

    b) $\sqrt{10}$

    c) $\dfrac{1}{3}$

    d) 3

ANSWERS:	1. A	2. D	3. D	4. A	5. C	6. C
7. A	8. D	9. A	10. C	11. D	12. A	13. D