CLEARLY SHOW WORK ON THE BACK OR ON A SEPARATE SHEET OF PAPER.
NO CALCULATOR!!!

1. Given $0 \le \theta < 2\pi$, solve for θ: $4\sin^2 \theta - 3 = 0$

2. Rewrite, then factor to solve for θ given that $0 \le \theta < 2\pi$.
   $1 + \sin \theta = 2\cos^2 \theta$

3. If $\sin \theta = \dfrac{3}{5}$ and $\dfrac{\pi}{2} < \theta < \pi$, find the exact value of $\sin 2\theta$.

4. Use a half angle identity to find the exact value of $\tan 165°$.

5. Use a sum/difference identity to evaluate $\sin(\dfrac{\pi}{2} - \theta)$.

6. Simplify: $\dfrac{\csc \theta \cot \theta}{\cos \theta}$

7. Simplify: $\dfrac{\sin \theta}{1 + \cos \theta} + \dfrac{\sin \theta}{1 - \cos \theta}$

> **CHECK**
> **ANSWERS #1-7:**
>
> $-\dfrac{24}{25}$ $\sqrt{3} - 2$
>
> $\csc^2\theta$ $\cos\theta$ $2\csc\theta$
>
> $\dfrac{3\pi}{2}$ $\dfrac{\pi}{6}$ $\dfrac{5\pi}{6}$
>
> $\dfrac{\pi}{3}$ $\dfrac{2\pi}{3}$ $\dfrac{4\pi}{3}$ $\dfrac{5\pi}{3}$

8. Given: X and Y are positive acute angles, $\sin X = \dfrac{3}{5}$, and $\cos Y = \dfrac{12}{13}$. Find the exact value of $\cos (X + Y)$.

9. Given: X and Y are positive acute angles, $\tan X = \dfrac{2}{3}$, and $\tan Y = \dfrac{1}{2}$. Find the exact value of $\tan (X + Y)$.

10. If $\sin \theta = \dfrac{\sqrt{7}}{3}$ and $90° \le \theta \le 180°$, then find the exact value of $\sin 2\theta$.

11. Find the exact value of $\sin 105°$ using a half angle identity.

12. Simplify: $\dfrac{\sin^2 \theta}{\cos \theta} + \cos \theta$ 13. Simplify: $\dfrac{\sec \theta}{\tan \theta}$ 14. Simplify: $\dfrac{1 - \sin^2 \theta}{2\cos \theta}$ 15. Simplify: $\dfrac{\sin 2\theta}{2\cos^2 \theta}$

> **check answers #8-15**
>
> $\dfrac{-2\sqrt{14}}{9}$ $\dfrac{7}{4}$ $\dfrac{33}{65}$ $\dfrac{1}{2}\sqrt{2 + \sqrt{3}}$ $\csc\theta$ $\dfrac{1}{2}\cos\theta$ $\tan\theta$ $\sec\theta$

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16. Use a sum or difference identity to evaluate $\sin(90° - \theta)$.

17. Use a sum or difference identity to evaluate $\sin 255°$.

18. If $\cos\theta = \dfrac{3}{4}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$, find $\tan 2\theta$.

19. Given $0 \le \theta < 2\pi$, solve for θ by factoring: $\tan^3 \theta = 3\tan \theta$

> **CHECK**
> **ANSWERS #16-19**
>
> $\dfrac{-\sqrt{2} - \sqrt{6}}{4}$ $-3\sqrt{7}$
>
> $\cos\theta$ 0 π
>
> $\dfrac{\pi}{3}$ $\dfrac{2\pi}{3}$ $\dfrac{4\pi}{3}$ $\dfrac{5\pi}{3}$