

1. **2.1** If $\sin(x) = -\frac{6}{\sqrt{61}}$ and $\tan(x) = \frac{6}{5}$, what is $\cos(x)$?

2. **2.1** Let $x = 7 \sin \theta$ and write $\sqrt{49 - x^2}$ as a trigonometric function of θ . Assume $0 \leq \theta < \frac{\pi}{2}$.

Bonus: What if the restriction on θ were $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{2}$? Would that change your answer?

If so, what would your answer be?

3. **2.2** Verify the identity $\sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}} = \frac{1 - \cos \theta}{|\sin \theta|}$

4. **2.2** Use a drawing to verify the identity $\cot\left(\sin^{-1}\left(\frac{x}{2}\right)\right) = \frac{\sqrt{4-x^2}}{x}$. Hint: Let $\theta = \sin^{-1}\left(\frac{x}{2}\right)$.

5. **2.3** Find all solutions θ , such that $0 \leq \theta \leq 2\pi$. Then find *all* solutions.

$$\sin^2 \theta = 3 \cos^2 \theta$$

6. **2.4** Find the exact values of sine, cosine, and tangent for $\theta = \frac{7\pi}{12} = \frac{\pi}{3} + \frac{\pi}{4}$. Simplify as much as you can without a calculator.