Homework Solution Example

If $\sin(t) = \frac{2}{3}$ and $\frac{\pi}{2} < t < \pi$, compute $\cos(t)$ & $\tan(t)$.

$$\cos^2 t = 1 - \sin^2 t \quad \text{(using the 1st Pythagorean identity)}$$
$$= 1 - \left(\frac{2}{3}\right)^2 \quad \text{substituting}$$
$$= 1 - \frac{4}{9} = \frac{5}{9}$$

$$\cos t = \frac{\sqrt{5}}{3} \quad \text{OR} \quad \cos t = -\frac{\sqrt{5}}{3}$$

Since $\frac{\pi}{2} < t < \pi$, it follows that $\cos t$ is negative.

$$\cos t = \frac{-\sqrt{5}}{3}$$

To compute $\tan t$, we use the identity $\tan t = (\sin t)/\cos t$ to obtain:

$$\tan t = \frac{2/3}{-\sqrt{5}/3} = \frac{2}{3} \times \frac{3}{-\sqrt{5}} = -\frac{2}{\sqrt{5}}$$

If required, we can rationalize the denominator (by multiplying by $\sqrt{5}/\sqrt{5}$) to obtain:

$$\tan t = \frac{-2\sqrt{5}}{5}$$

from: Pre Calculus by David Cohen, pgs: 350-351.
(UCLA Professor)

→ scanning example: writing within the margins, normal letter size, neat, dark pen, white paper. Used lined paper underneath.