MATH 125 QUIZ #4 (FALL 2020)

1 Evaluate $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$.

Let $\theta = \cos^{-1}\left(\cos\frac{7\pi}{6}\right)$, so $\cos\theta = \cos\frac{7\pi}{6}$ for some $\theta \in [0, \pi]$. The angle $\frac{7\pi}{6}$ puts a 30-60-90-degree triangle in Quadrant III, which when flipped over the x-axis becomes a similar triangle in Quadrant II with hypotenuse on the terminal side of $\theta = \frac{5\pi}{6}$, our answer.

2 Evaluate $\sin(\sin^{-1}(-1.5))$.

Undefined, since $\theta = \sin^{-1}(-1.5)$ implies $\sin\theta = -1.5$, which is impossible.

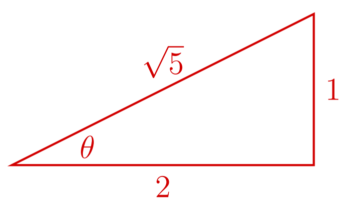
3 Evaluate $\cot\left(\sin^{-1}(-\frac{1}{2})\right)$.

Let $\theta = \sin^{-1}(-\frac{1}{2})$, so $\sin\theta = -\frac{1}{2}$ for some $\theta \in [-\frac{\pi}{2}, \frac{\pi}{2}]$, and thus $\theta = -\frac{\pi}{6}$. Then:

$$\cot\left(\sin^{-1}(-\tfrac{1}{2})\right) = \cot\left(-\tfrac{\pi}{6}\right) = -\sqrt{3}.$$

4 Evaluate $\csc\left(\tan^{-1}\frac{1}{2}\right)$.

Let $\theta = \tan^{-1}(\frac{1}{2})$, so $\tan\theta = \frac{1}{2}$ for $\theta \in (-\frac{\pi}{2}, \frac{\pi}{2})$. This implicates θ in a right triangle in Quadrant I as follows:



From this we can see that $\csc\left(\tan^{-1}\frac{1}{2}\right) = \csc\theta = \sqrt{5}$.