Practice Problems for Math Success

Inverse Trignometric Functions

These **practice problems** are designed to help you **prepare for our course exams** and **assess your understanding** of the course material at the expected level. Aim to complete them **in class, during tutoring, office hours, or on your own**, and try to solve them **without notes or a calculator**, just like on the **actual exams**. Remember, **practice makes perfect**, so don't hesitate to **ask for help** if you get stuck.

1. Without a calculator, evaluate the following exactly.

   (a) $\cos^{-1}(1/2)$

   (b) $\arccos(-1/2)$

   (c) $\cos(\cos^{-1}(1/2))$

   (d) $\cos^{-1}(\cos(5\pi/3)$

   (e) $\sin^{-1}(1)$

   (f) $\arcsin(-1)$

   (g) $\tan^{-1}(0)$

   (h) $\arctan(1)$

2. (a) Compute $\arcsin\left(\frac{-\sqrt{3}}{2}\right) + \arctan(1)$.

(b) Find the exact value of

$$\tan\left(\cos^{-1}\left(-\frac{1}{5}\right)\right)$$

3. Use the trigonometric identity

$$\sin(\theta + \phi) = \sin(\theta)\cos(\phi) + \sin(\phi)\cos(\theta)$$

to find the exact value of

$$\sin\left(\tan^{-1}\left(\frac{1}{4}\right) + \cos^{-1}\left(\frac{4}{5}\right)\right).$$

Show all your work.