

You must show all of your work on the exam booklet to receive full credit. All communication devices such as cell phones are not allowed.

- (15 points) Write $\cos(\sin^{-1} u)$ as an algebraic expression in u .
- (15 points) Find the exact value of
 - $\sin^{-1}(\sin \frac{5\pi}{4})$.
 - $\cos[\cos^{-1}(1.3)]$

For problem 3, side a is opposite angle A , side b is opposite angle B , side c is opposite angle C . Round all answers to two decimal places.

- (15 points) Solve the triangle: $b = 8$, $c = 9$, $B = 30^\circ$
- (10 points) Find the area of the triangle: $a = 8$, $b = 4$, $C = 70^\circ$
- (15 points) Establish the given identity.

$$\frac{1 - \cos x}{\sin x} + \frac{\sin x}{1 - \cos x} = 2 \csc x$$

- (15 points) Let

$$\begin{aligned}\cos \alpha &= \frac{1}{2}, \quad 0 < \alpha < \frac{\pi}{2} \\ \sin \beta &= -\frac{4}{5}, \quad -\frac{\pi}{2} < \beta < 0\end{aligned}$$

Find the exact solution of $\sin(\alpha - \beta)$.

- (15 points) Solve the equation.

$$\cos^2 \theta = 4(\sin \theta + 1)$$

Give a general formula of all solutions. Decimal approximations will not be accepted.