Find the phase shift of the trigonometric function:

\[ y = -4 \cos\left(\frac{\pi}{3} x - 1\right) + 2 \]

Answer: _____________

Round 1 2 3 4 5
Simplify the following expression to one of the form $\sin^B x$: 

$$2 \left(1 - \frac{\sec^2 x}{\sec^2 x} \right) \frac{2}{\csc x}$$

Find $A + B$.

Answer: _____________

Round 1 2 3 4 5

---

Simplify the following expression to one of the form $\sin^B x$: 

$$2 \left(1 - \frac{\sec^2 x}{\sec^2 x} \right) \frac{2}{\csc x}$$

Find $A + B$.

Answer: _____________

Round 1 2 3 4 5
In Triangle ABC, angle A is 60°, side b is 6 m, and angle C is thirty more than one half angle B. Find the sum of the number of degrees in angle B and the number of meters in side C.

Answer: _____________

Round 1 2 3 4 5
Find the perimeter of triangle UCF if \( u = 4 \), \( c = 8 \), and \( F = 120^\circ \).

Answer: _____________

Round 1 2 3 4 5
cos(7x) − cos(3x) = A sin Bx sin Cx

Find : |A| + |B| + |C|

Answer : _____________

Round 1 2 3 4 5
\[
\cos x = \frac{-9}{15}, \sin y = \frac{5}{13}, \frac{\pi}{2} \leq x \leq \pi, \frac{\pi}{2} \leq y \leq \pi
\]

\[
\sin(x + y) = ?
\]

Give answer as a simplified fraction.

Answer : _____________

Round 1 2 3 4 5
#7 Trig – Hustle
National MAΘ 2008

\[ \text{Arc sin}(\cos(Arc \tan(-\frac{1}{\sqrt{3}}))) = ? \]

Answer: _____________

Round 1 2 3 4 5

#7 Trig – Hustle
National MAΘ 2008

\[ \text{Arc sin}(\cos(Arc \tan(-\frac{1}{\sqrt{3}}))) = ? \]

Answer: _____________

Round 1 2 3 4 5
\[
\begin{align*}
\cos^2 x & \quad \left| \begin{array}{cc}
1 & \sec x \\
\sec x & 1
\end{array} \right| = A \sin^b x \\
Find: A - B.
\end{align*}
\]

Answer: _____________

Round 1 2 3 4 5
Solve for x:

\[ 2 \sin^2 x + 7 \sin x + 3 = 0 \]
\[ -\pi \leq x \leq 0 \]

Answer: _____________

Round 1 2 3 4 5
Find the maximum value:

\[ y = -2\sin(4x - \pi) + 1 \]

Answer: _____________

Round 1 2 3 4 5

Find the maximum value:

\[ y = -2\sin(4x - \pi) + 1 \]

Answer: _____________

Round 1 2 3 4 5
\[ \cos y = x^2 - 2 \]
\[ \cos 2y = Ax^4 + Bx^2 + C \]

Find \( A + B + C \).

Answer: _____________

Round 1 2 3 4 5

Round 1 2 3 4 5
Given: $0 \leq \theta \leq \frac{\pi}{2}$
\[
\cos \theta = x^2 \\
\cot \theta = ?
\]

Answer: _____________

Round 1 2 3 4 5
Given: $0 < y < \frac{\pi}{2}$

$2 \sin y - 4 \sin y \cos y = 0$

$\sin(2y) = ?$

Answer: _____________

Round 1 2 3 4 5
P = period of the function
A = vertical shift of the function

Find P/A.

\[ y = -3 \tan\left(\frac{2\pi x}{3} - 1\right) + 5 \]

Answer : _____________

Round 1 2 3 4 5
Find the area of triangle ABC if $a = 8$, $b = 12$, and angle $C = 45^\circ$.

Answer: _____________

Round 1 2 3 4 5
\[ \cos(\frac{5\pi}{12}) = \frac{\sqrt{x - \sqrt{y}}}{x} \]

\[ x + y = ? \]

Answer: _____________

Round 1 2 3 4 5
Find : $xy$.

Answer : _____________

Round 1 2 3 4 5
In triangle ABC; \(c = 10\), \(a = 20\), and \(C = 30^\circ\). Find the sum of all possible values of angle \(B\) in degrees.

Answer: _____________
Round 1 2 3 4 5

In triangle ABC; \(c = 10\), \(a = 20\), and \(C = 30^\circ\). Find the sum of all possible values of angle \(B\) in degrees.

Answer: _____________
Round 1 2 3 4 5
Eric is dying for a Mountain Dew. He is in a town where he doesn’t know his way around really well. He leaves his hotel heading north for 20 miles. He turns east and goes 10 more miles. Eric gets really thirsty and decides to go 50 miles south looking for his Mountain Dew. He turns east again and goes 5 more miles. One last ditch attempt: 15 miles north. Now that he has himself completely lost, what bearing in degrees is Eric at with respect to his hotel?

Answer : _____________

Round    1    2    3    4    5
Jack and Jill are flying kites. They both are flying at a height of 12 meters. Jack’s cord is 20 meters, and Jill’s is 15 meters. Find the shortest distance in meters that Jack can stand away from Jill and have his kite intersect hers.

Answer : _____________

Round 1 2 3 4 5

Answer : _____________

Round 1 2 3 4 5
\[
\cot(\sin^{-1}\left(\frac{4}{\sqrt{x^2 + 16}}\right))
\]

Answer: _____________

Round 1 2 3 4 5

\[
\cot(\sin^{-1}\left(\frac{4}{\sqrt{x^2 + 16}}\right))
\]

Answer: _____________

Round 1 2 3 4 5
\[
\sum_{i=1}^{15} \cos (i\pi) + \sin (i\pi) = ?
\]

Answer: _____________

Round 1 2 3 4 5

Answer: _____________

Round 1 2 3 4 5
In triangle XYZ, \( \angle X = 30^\circ \), \( \angle Y = 45^\circ \), and \( x = 12 \text{ units} \). Find \( y \).

Answer : _____________

Round 1 2 3 4 5

In triangle XYZ, \( \angle X = 30^\circ \), \( \angle Y = 45^\circ \), and \( x = 12 \text{ units} \). Find \( y \).

Answer : _____________

Round 1 2 3 4 5
If \( z \) is of the form \( z = \alpha \sqrt{6} + \beta \sqrt{2} \), find \( \alpha + \beta \).

**Answer:** ______________

Round 1 2 3 4 5
\[
\cos\left(-\frac{11\pi}{6}\right) = ?
\]

Answer: _____________

Round 1 2 3 4 5