Problem

a) Find the values of the six trigonometric functions of $\theta$ for the right angle triangle $ABC$ with the given sides.

Find the values of the six trigonometric functions of $\theta$ for the right angle triangle $ABC$ with the given sides.

\[ A \]

\[ b = \sqrt{5} \]

\[ \theta \]

\[ B \]

\[ C \]

\[ a = \sqrt{7} \]

b) Use the Reference Angle Theorem to find the exact value of each trigonometric function.

\[ \sin(225) = \]

\[ \csc(420) = \]

c) Find the exact value of the expression

\[ \sin\left(\frac{3\pi}{4}\right) \tan\left(\frac{\pi}{4}\right) + \cos\left(\frac{3\pi}{4}\right) \sin\left(\frac{\pi}{6}\right) = \]

d) Find the values of all trigonometric functions if $\cos x = -\frac{\sqrt{2}}{2}$ and $\frac{\pi}{2} \leq x \leq \pi$

Problem # Graph at least one full period of the function $y = 2\sin x$

Problem #.

a) For what values of $x$ is $y = \tan 2x$ function not defined?

a) For what values of $x$ is $y = \sec x$ not defined?

Problem #7 Use the trigonometric identities to write given expression in terms of a single trigonometric function or constant.

a) $\frac{\csc \theta - \sin \theta}{\csc \theta} =$
b) \ \frac{1}{1 - \sin t} + \frac{1}{1 + \sin t} =

**Problem #8** State the amplitude, period and draw the graph of the function

\[ y = 3 \sin \pi x \]

**Problem #1 (10 pts)** Find the exact value of each expression

a) \( \cos \left( \frac{\pi}{4} + \frac{\pi}{3} \right) = \)

b) \( \sin 105 \sin 15 = \)

**Problem #** Find exact value of given inverse trigonometric functions

a) \( \sin^{-1}(\sin \frac{\pi}{6}) = \)

b) \( \tan^{-1}\sqrt{3} = \)

c) \( \cot^{-1}1 = \)

**Problem #** Write each expression in terms of a single trigonometric function

a) \( \sin x \cos 2x - \sin 2x \cos x = \)

b) \( \cos 4x \cos 3x - \sin 4x \sin 3x = \)

**Problem #** Verify the following identities

a) \( \cos(x - y) + \cos(x + y) = 2 \cos x \cos y \)

b) \( \sin^2 x + \cos 2x = \cos^2 x \)

c) \( \sin 4x = 4 \sin x \cos^3 x - 4 \cos x \sin^3 x \)

**Problem #** Find the exact value of \( \sin 2x, \ \cos 2x \) if \( \cos x = -\frac{4}{5} \) and \( x \) is in second quadrant.

**Problem #** Write each expression as the sum or difference of two functions

a) \( \sin 3x \cos x = \)

b) \( \cos 4x \cos x = \)

**Problem #** Write each expression as the product of two functions.

a) \( \cos 2x - \cos 4x = \)

b) \( \sin 3x - \sin x = \)

**Problem #** Solve each equation for exact solutions in the interval \([0, 2\pi]\):

a) \( 2 \sin x - \sqrt{3} = 0 \)
b) \[2 \sin x \cos x = \sqrt{2} \sin x\]

c) \[2 \sin^2 x = 1 - \cos x\]

**Problem #.** Solve the triangle if \(B = 30, \ C = 45\) and \(a = 22\).

**Problem #.** Find the third side and area of triangle \(ABC\) if \(a = 18, \ b = 25\) and \(C = 120\).

**Problem #.** Use Heron’s formula to find the area of triangle \(ABC\) if \(a = 10, \ b = 21\) and \(c = 17\).

**Problem #.** Find the magnitude and unit vector in the direction of vector \(v = -3i -8j\).

**Problem #.** Compute \(3u - 4v\) if \(v = 2i - 3j\) and \(u = 3i - 4j\).

**Problem #.** Find the angle between the following two vectors \(u\) and \(v\) from the problem 5.