Class Practice on Trigonometry #1

1. Sketch a right triangle with \( c = 5 \) and \( a = 2 \). Label all sides and angles with appropriate letters.

Using your triangle determine the exact value of each of the following trigonometric ratios. Leave answers in simplified radical form.

a. \( \sin A = \)

b. \( \sin B = \)

c. \( \cos A = \)

d. \( \cos B = \)

e. \( \tan A = \)

f. \( \tan B = \)

2. In a right triangle if \( \cos B = \frac{1}{4} \), draw a triangle that "looks like" this would be true and then determine the exact value of each of the following trigonometric ratios. Leave answers in simplified radical form.

a. \( \sin A = \)

b. \( \sin B = \)

c. \( \cos A = \)

d. \( \cos B = \)

e. \( \tan A = \)

f. \( \tan B = \)
1. Sketch a right triangle with \( c = 5 \) and \( a = 2 \). Label all sides and angles with appropriate letters.

\[
\begin{align*}
\text{B} & \quad \text{a = 2} \\
C & \quad \text{b = } \sqrt{21} \\
A & \quad \text{c = 5}
\end{align*}
\]

\[
a^2 + b^2 = c^2 \\
4 + b^2 = 25 \\
b^2 = 21 \\
b = \sqrt{21}
\]

Using your triangle determine the exact value of each of the following trigonometric ratios. Leave answers in simplified radical form.

a. \( \sin A = \frac{2}{5} \)

b. \( \sin B = \frac{\sqrt{21}}{5} \)

c. \( \cos A = \frac{\sqrt{21}}{5} \)

d. \( \cos B = \frac{2}{5} \)

e. \( \tan A = \frac{\frac{2}{\sqrt{21}}}{\frac{\sqrt{21}}{\sqrt{21} \cdot \sqrt{21}}} = \frac{2\sqrt{21}}{21} \)

f. \( \tan B = \frac{\sqrt{21}}{2} \)

Here we rationalize the denominator.
2. In a right triangle if \( \cos B = \frac{1}{4} \), draw a triangle that “looks like” this would be true and then determine the exact value of each of the following trigonometric ratios. Leave answers in simplified radical form.

Since \( \cos B = \frac{1}{4} \), we need to draw a triangle where the adjacent side is 1 and the hypotenuse is 4 (for angle B).

\[ a = 1 \]
\[ b = \sqrt{15} \] by using the Pythagorean Theorem
\[ c = 4 \]

\[ \sin A = \frac{1}{4} \]
\[ \sin B = \frac{\sqrt{15}}{4} \]
\[ \cos A = \frac{\sqrt{15}}{4} \]
\[ \cos B = \frac{1}{4} \]
\[ \tan A = \frac{1}{\sqrt{15}} = \frac{\sqrt{15}}{15} \]
\[ \tan B = \frac{\sqrt{15}}{1} = \sqrt{15} \]

Here we rationalize the denominator.