1. Find the distance between the points \((1, -4)\) and \((-5, 6)\). Provide the exact answer in a simplified form.

\[
d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2} = \sqrt{(-5-1)^2 + (6+4)^2} = \sqrt{36+100} = \sqrt{136} = \sqrt{4 \times 34} = 2\sqrt{34}
\]

2. ABC is a right triangle with the right angle at A. Given that \(a = 3\sqrt{5}\) cm, and \(c = 2\) cm, find the exact value of \(b\). Also find the area of the triangle.

\[
a^2 = b^2 + c^2 \\
(3\sqrt{5})^2 = b^2 + 2^2 \\
b^2 = 45 - 4 \\
b = \sqrt{41}
\]

Area of \(\triangle ABC\) = \(\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 2 \times \sqrt{41} = \sqrt{41} \text{ cm}^2\)

3. (b) Convert 69.467° into degrees, minutes, and seconds.

\[
69.467° = 69° + 0.467 \times 60' = 69° + 28' + 0.02' = 69° 28' + (0.02 \times 60)'' = 69° 28' 1''
\]

(a) Convert 87°26'45" into degrees and decimal degrees (two decimal places)

\[
87° + \frac{26}{60} + \frac{45}{3600} = \approx 87.45°
\]

4. Given that the point \(P(7, -24)\) is on the terminal side of some angle \(\theta\) in the standard position, find the exact values of all the trigonometric functions of \(\theta\).

\[
\sin \theta = \frac{y}{r} = -\frac{24}{25} \\
\cos \theta = \frac{x}{r} = \frac{7}{25} \\
\tan \theta = \frac{y}{x} = -\frac{24}{7} \\
\csc \theta = \frac{r}{y} = \frac{25}{-24}
\]

5. Given \(\sec \alpha = \frac{-7}{\sqrt{2}}\) with \(\alpha\) in quadrant II, find the exact value of \(\sin \alpha\). Use only the trigonometric identities to solve this problem.

\[
\therefore \cos \alpha = \frac{1}{\sec \alpha} = -\frac{\sqrt{2}}{7} \\
\text{Use: } \sin^2 \alpha + \cos^2 \alpha = 1 \\
\sin^2 \alpha + \left(-\frac{\sqrt{2}}{7}\right)^2 = 1 \\
\therefore \sin^2 \alpha + \frac{2}{49} = 1 \\
\therefore \sin^2 \alpha = 1 - \frac{2}{49} = \frac{47}{49} \\
\therefore \sin \alpha = \pm \frac{\sqrt{47}}{7} \\
\text{But } \alpha \text{ is in quad II} \\
\therefore \sin \alpha = -\frac{\sqrt{47}}{7}
\]
6. Given \( \tan \theta = \frac{5}{6} \) with \( \theta \) in quadrant III, find the exact values of all the trigonometric functions of \( \theta \). Use any method to solve this problem.

\[
\tan \theta = \frac{5}{6} = \frac{y}{x} = -\frac{5}{6}
\]

\[
\therefore \tan \theta = \frac{y}{x} = -\frac{5}{6}
\]

\[
\therefore \cos \theta = \frac{x}{r} = \frac{6}{\sqrt{61}}
\]

\[
\therefore \sin \theta = \frac{y}{r} = -\frac{5}{\sqrt{61}}
\]

\[
\therefore \sec \theta = \frac{r}{x} = \frac{\sqrt{61}}{6}
\]

\[
\therefore \csc \theta = \frac{r}{y} = -\frac{\sqrt{61}}{5}
\]

7. Given \( \csc \beta = -\frac{\sqrt{7}}{2} \) with \( \beta \) in quadrant IV, find the exact values \( \cos \beta \) and \( \tan \beta \). Use only the trigonometric identities to solve this problem.

\[
\csc \beta = -\frac{\sqrt{7}}{2}
\]

\[
\therefore \sin \beta = \frac{1}{\csc \beta} = -\frac{2}{\sqrt{7}}
\]

\[
\csc \beta = -\frac{\sqrt{7}}{2}
\]

\[
\therefore \tan \beta = \sin \beta = -\frac{2\sqrt{7}}{7}
\]

\[
\cos \beta = \cos \beta = \frac{\sqrt{3}}{\sqrt{7}}
\]

8. Draw an angle of \(-450^\circ\) in the standard position. Then use a suitable \(x - y - r\) calculation to find all trig functions of \(-450^\circ\). Must show the \(x, y, r\) values, and the steps of your calculation, not just the final answer.

\[
\alpha = 0
\]

\[
\therefore r = 2
\]

\[
\sin(-450^\circ) = \frac{y}{r} = \frac{-2}{2} = -1
\]

\[
\csc(-450^\circ) = \frac{r}{y} = \frac{2}{-2} = -1
\]

\[
\cos(-450^\circ) = \frac{x}{r} = \frac{0}{2} = 0
\]

\[
\sec(-450^\circ) = \frac{r}{x} = \frac{2}{0} = \text{undef}
\]

\[
\tan(-450^\circ) = \frac{y}{x} = \frac{-2}{0} = \text{undef}
\]

\[
\cot(-450^\circ) = \frac{x}{y} = \frac{0}{-2} = 0
\]

9. Evaluate \(-3\cos^3 540^\circ + 2\sin^2 450^\circ - 5 \cot^2 630^\circ\). Show each line of your calculation carefully.

\[
\begin{align*}
\text{Note: } \cot 630^\circ & \text{ is equal to zero, not undefined.}
\end{align*}
\]

\[
\begin{align*}
\cos(-1)^3 + 2(1)^2 - 5(0)^2
\end{align*}
\]

\[
\begin{align*}
3 + 2 - 0
\end{align*}
\]

\[
\begin{align*}
5
\end{align*}
\]

10. The equation of the terminal side of an angle \( \theta \) in the standard position is given by \( 5x - 6y = 0 \), \( x \leq 0 \). Find the exact values of \( \cos \theta \) and \( \csc \theta \).

\[
\begin{align*}
5x - 6y &= 0 \quad \text{with } x \leq 0
\end{align*}
\]

\[
\begin{array}{c|c|c}
\hline
x & y \\
\hline
-6 & 5 \\
0 & 0 \\
\hline
\end{array}
\]

\[
\begin{align*}
\therefore \cos \theta &= \frac{x}{r} = \frac{-6}{\sqrt{61}}
\end{align*}
\]

\[
\begin{align*}
\therefore \csc \theta &= \frac{r}{y} = \frac{-\sqrt{61}}{5}
\end{align*}
\]
1. Find the distance between the points \((1, -4)\) and \((-5, 6)\). Provide the exact answer in a simplified form.

2. \(ABC\) is a right triangle with the right angle at \(A\). Given that \(a = 3\sqrt{5}\) cm, and \(c = 2\) cm, find the exact value of \(b\). Also find the area of the triangle.

3. (b) Convert \(69.467^\circ\) into degrees, minutes, and seconds.
   (a) Convert \(87^\circ 26' 45''\) into degrees and decimal degrees (two decimal places)

4. Given that the point \(P(7, -24)\) is on the terminal side of some angle \(\theta\) in the standard position, find the exact values of all the trigonometric functions of \(\theta\).

5. Given \(\sec \alpha = \frac{-7}{\sqrt{2}}\) with \(\alpha\) in quadrant II, find the exact value of \(\sin \alpha\). Use only the trigonometric identities to solve this problem.
6. Given $\tan \theta = \frac{5}{6}$ with $\theta$ in quadrant III, find the exact values of all the trigonometric functions of $\theta$. Use any method to solve this problem.

7. Given $\csc \beta = -\frac{\sqrt{7}}{2}$ with $\beta$ in quadrant IV, find the exact values $\cos \beta$ and $\tan \beta$. Use only the trigonometric identities to solve this problem.

8. Draw an angle of $-450^\circ$ in the standard position. Then use a suitable $x - y - r$ calculation to find all trig functions of $-450^\circ$. Must show the $x, y, r$ values, and the steps of your calculation, not just the final answer.

9. Evaluate $-3\cos^3 540^\circ + 2\sin^2 450^\circ - 5 \cot^2 630^\circ$. Show each line of your calculation carefully.

10. The equation of the terminal side of an angle $\theta$ in the standard position is given by $5x - 6y = 0$, $x \leq 0$. Find the exact values of $\cos \theta$ and $\csc \theta$. 