ICM Trigonometry Worksheet #5

Given a point on the terminal side of an angle $\theta$, find the exact value of each of the six trig functions of $\theta$.

1. (-3, 4)

$\sin\theta = \frac{4}{5}$ $\quad \csc\theta = \frac{5}{4}$

$\cos\theta = -\frac{3}{5}$ $\quad \sec\theta = -\frac{5}{3}$

$\tan\theta = -\frac{4}{3}$ $\quad \cot\theta = -\frac{3}{4}$

2. (2, -3)

$\sin\theta = -\frac{3}{\sqrt{13}}$ $\quad \csc\theta = -\frac{\sqrt{13}}{3}$

$\cos\theta = \frac{2}{\sqrt{13}}$ $\quad \sec\theta = \frac{\sqrt{13}}{2}$

$\tan\theta = -\frac{3}{2}$ $\quad \cot\theta = -\frac{2}{3}$

3. (2, 2)

$\sin\theta = \frac{2}{\sqrt{8}} = \frac{1}{\sqrt{2}}$ $\quad \csc\theta = \frac{\sqrt{8}}{2} = \sqrt{2}$

$\cos\theta = \frac{2}{\sqrt{8}} = \frac{1}{\sqrt{2}}$ $\quad \sec\theta = \frac{\sqrt{8}}{2} = \sqrt{2}$

$\tan\theta = 1$ $\quad \cot\theta = 1$

Find the exact value of each of the remaining trig functions of $\theta$.

4. $\sin\theta = \frac{12}{13}, 90° < \theta < 180°$

$\csc\theta = \frac{13}{12}$

$\cos\theta = -\frac{5}{13}$ $\quad \sec\theta = -\frac{13}{5}$

$\tan\theta = -\frac{12}{5}$ $\quad \cot\theta = -\frac{5}{12}$

5. $\cos\theta = \frac{-4}{5}, \pi < \theta < 3\pi/2$

$\sin\theta = -\frac{3}{5}$ $\quad \csc\theta = -\frac{5}{3}$

$\tan\theta = \frac{3}{4}$ $\quad \sec\theta = -\frac{5}{4}$

$\cot\theta = \frac{4}{3}$

6. $\sec\theta = 2, \sin\theta < 0$

$\sin\theta = -\frac{\sqrt{3}}{2}$ $\quad \csc\theta = -\frac{2}{\sqrt{3}}$

$\cos\theta = \frac{1}{2}$ $\quad \cot\theta = -\frac{1}{\sqrt{3}}$

$\tan\theta = -\sqrt{3}$