MAS506 TRIGONOMETRY PRACTICE

1. A circle has a radius of 25 *cm*. What is the length of the arc sub-tended by a central angle measuring 104°?

2. What are the exact coordinates of a trigonometric point, $P(\theta)$, found in the second quadrant, given $\tan\theta = -\frac{12}{35}$?

3. Knowing that $\sin a = \frac{13}{85}$, where $a \in \left[\frac{\pi}{2}, \pi\right[$ and $\sin b = -\frac{63}{65}$, where $b \in \left[\frac{3\pi}{2}, 2\pi\right[$, determine the exact values of …

   a) $\sin(a + b)$

   b) $\cos(a - b)$

   c) $\tan(a + b)$

4. Solve for x.

   a) $x = \cot 145°$

   b) $6\sin x - 2 = 1$, $x \in \left[\frac{\pi}{2}, \pi\right[$

   c) $5\tan x + 3 = -2$, $x \in [0, 360°[$

   d) $\csc x = -2.79$, $x \in [0, 2\pi[$

5. If $\cos\theta = \frac{60}{61}$, where $\theta \in \left[\frac{3\pi}{2}, 2\pi\right[$, find…

   a) $\sin\theta$ c) $\csc\theta$

   b) $\tan\theta$ d) $\sec\theta$

6. Determine the exact coordinates of the trigonometric point $P\left(-\frac{29\pi}{6}\right)$.

7. Prove the following identities.

   a) $\frac{\sin^2\theta + 4\sin\theta + 3}{\cos^2\theta} = \frac{3 + \sin\theta}{1 - \sin\theta}$ b) $\tan\theta + \frac{\cos\theta}{1 + \sin\theta} = \sec\theta$

8. If $P(\theta) = \left(\frac{20}{101}, \frac{99}{101}\right)$ and $P(\varphi) = \left(-\frac{56}{65}, -\frac{33}{65}\right)$, determine $\cos(\theta + \varphi)$.