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・一般角の三角関数

(例1) θが次の角のとき，$\sin\theta$, $\cos\theta$, $\tan\theta$ の値を求めよ

(1) $\frac{9}{4}\pi$　(2) $-\frac{\pi}{3}$　(3) $-\frac{17}{6}\pi$

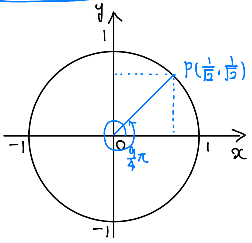
point
$0 \leqq \theta < 2\pi$ 以外の角における $\sin\theta$, $\cos\theta$, $\tan\theta$ は
今まで通り，θの動径をかいて求めればよい

(1)

$\sin\left(\frac{9}{4}\pi\right) = \frac{1}{\sqrt{2}}$

$\cos\left(\frac{9}{4}\pi\right) = \frac{1}{\sqrt{2}}$

$\tan\left(\frac{9}{4}\pi\right) = 1$

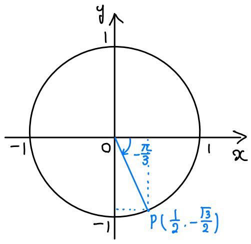


(2)

$\sin\left(-\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{2}$

$\cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$

$\tan\left(-\frac{\pi}{3}\right) = -\sqrt{3}$

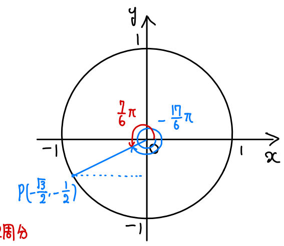


(3)

$\sin\left(-\frac{17}{6}\pi\right) = -\frac{1}{2}$

$\cos\left(-\frac{17}{6}\pi\right) = -\frac{\sqrt{3}}{2}$

$\tan\left(-\frac{17}{6}\pi\right) = \frac{1}{\sqrt{3}}$



(別解)

$\sin\left(-\frac{17}{6}\pi\right) = \sin\left(-\frac{17}{6}\pi + \overset{2周分}{4\pi}\right) = \sin\frac{7}{6}\pi = -\frac{1}{2}$

$\cos\left(-\frac{17}{6}\pi\right) = \cos\left(-\frac{17}{6}\pi + 4\pi\right) = \cos\frac{7}{6}\pi = -\frac{\sqrt{3}}{2}$

$\tan\left(-\frac{17}{6}\pi\right) = \tan\left(-\frac{17}{6}\pi + 4\pi\right) = \tan\frac{7}{6}\pi = \frac{1}{\sqrt{3}}$

(例2) 次の式の値を求めよ

(1) $\cos\left(\frac{\pi}{2}+\theta\right)\sin(3\pi-\theta) - \sin\left(\frac{3}{2}\pi+\theta\right)\cos(\pi-\theta)$

(2) $\sin\frac{13}{14}\pi + \cos\frac{11}{14}\pi + \sin\frac{5}{7}\pi - \sin\frac{\pi}{14}$

point
角がそろっていない場合や有名角以外の角の場合
角をそろえて計算する

(1) (与式) $= -\sin\theta\,\sin\{(\pi-\theta)+2\pi\} - \sin\left\{\left(\frac{\pi}{2}+\theta\right)+\pi\right\}\cdot(-\cos\theta)$

$= -\sin\theta\,\sin(\pi-\theta) + \left\{-\sin\left(\frac{\pi}{2}+\theta\right)\right\}\cos\theta$

$= -\sin\theta\,\sin\theta - \cos\theta\,\cos\theta$

$= -(\sin^2\theta + \cos^2\theta)$

$= -1$ //　← 任意のθについて「$=-1$」が成り立つ。

(別解) 正確な解答ではない

θ=0を代入して

(与式) $= \cos\frac{\pi}{2}\underbrace{\sin 3\pi}_{0} - \underbrace{\sin\frac{3}{2}\pi}_{-1}\underbrace{\cos\pi}_{-1} = -(-1)\cdot(-1) = -1$ //

(2) $\sin\overset{\pi-\frac{\pi}{14}}{\frac{13}{14}\pi} + \cos\overset{\frac{\pi}{2}+\frac{2}{7}\pi}{\frac{11}{14}\pi} + \sin\overset{\pi-\frac{2}{7}\pi}{\frac{5}{7}\pi} - \sin\frac{\pi}{14}$

$= \sin\frac{\pi}{14} - \sin\frac{2}{7}\pi + \sin\frac{2}{7}\pi - \sin\frac{\pi}{14}$

$= 0$ //