Bellwork Wednesday, May 1, 2019

1. Is each pair of angles coterminal?

a) $-372°$ and $1068°$

b) $\frac{17\pi}{12}$ and $\frac{77\pi}{12}$

2. Find the exact value of each.

a) $\tan\frac{-15\pi}{2}$

b) $\cos\frac{157\pi}{6}$

c) $\sin(-2580°)$

d) $\tan\frac{41\pi}{3}$

3. Given $\cos\theta > 0$ and $\sin\theta = \frac{\sqrt{2}}{2}$ find $\tan\theta$.

4. Find both a positive and negative coterminal angle for each.

a) $\theta = 2176°$

b) $\theta = \frac{-62\pi}{15}$

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Answers

1. Is each pair of angles coterminal?

a) $-372°$ and $1068°$

- $1068 - -372 = 1440$
- $\frac{1440}{360} = 4$

Yes, they are Coterminal. They are a multiple of 360° apart

b) $\frac{17\pi}{12}$ and $\frac{77\pi}{12}$ $\quad \frac{77\pi}{12} - \frac{17\pi}{12} = \frac{60\pi}{12} = 5\pi$

No, they are not coterminal. They are not a multiple of 2π apart

2. Find the exact value of each.

a) $\tan\frac{-15\pi}{2}$ = undefined

$\frac{-15\pi}{2} + \frac{4\pi}{2} \cdots = \frac{\pi}{2}$

$\tan\frac{-15\pi}{2} = \tan\frac{\pi}{2} = \frac{1}{0}$

b) $\cos\frac{157\pi}{6} = \frac{\sqrt{3}}{2}$

$\frac{157\pi}{6} - \frac{12\pi}{6} \cdots = \frac{\pi}{6}$

$\cos\frac{157\pi}{6} = \cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$

c) $\sin(-2580°) = -\frac{\sqrt{3}}{2}$

$-2580° + 360° \cdots = 300°$

$\sin(-2580°) = \sin(300°) = -\sqrt{3}/2$

d) $\tan\frac{41\pi}{3} = -\sqrt{3}$

$\frac{41\pi}{3} - \frac{6\pi}{3} \cdots = \frac{5\pi}{3}$

$\tan\frac{41\pi}{3} = \tan\frac{5\pi}{3} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$

3. Given $\cos\theta > 0$ and $\sin\theta = \frac{\sqrt{2}}{2}$ find $\tan\theta$.

Quad I & IV

Quad I & II

must be in Quadrant I

$\sin\theta = \frac{\sqrt{2}}{2}$ at $\theta = 45°$

$\tan 45° = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

4. Find both a positive and negative coterminal angle for each.

a) $\theta = 2176°$ $\quad \pm 360°$

POS:

$16°, 376°, 736°, 1096°, 1456°, 1816°, \ldots, 2536°, 2896°, \ldots$

NEG:

$-344°, -704°, -1064°, \ldots$

b) $\theta = \frac{-62\pi}{15}$ $\quad \pm 2\pi = \pm\frac{30\pi}{15}$

POS

$\frac{28\pi}{15}, \frac{58\pi}{15}, \frac{88\pi}{15}, \ldots$

NEG:

$-\frac{2\pi}{15}, -\frac{32\pi}{15}, \ldots, -\frac{92\pi}{15}, -\frac{122\pi}{15}, \ldots$