Practice 13-6

The Tangent Function

Identify the period and tell where the asymptotes occur, in the interval from 0 to 2π, for each function.

$\frac{\pi}{1} \cdot \frac{4}{1}$ period = 4π

1. $y = \tan 2\theta$

$P = \frac{\pi}{2}$ VA: $\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

2. $y = \tan\frac{\theta}{2}$ $P = 2\pi$

VA: $\theta = \frac{1}{4}$

$\frac{\pi}{2(2\pi)} = \frac{1}{4}$

3. $y = \tan\frac{\theta}{4}$ VA: $\frac{\pi}{8\pi} = \frac{1}{8}$

4. $y = \tan 4\theta$

$P = \frac{\pi}{4}$

VA = $\frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{11\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}$

5. $y = \tan\frac{\pi}{2}\theta$ $P = \frac{\pi}{1} \cdot \frac{2}{\pi} = 2$
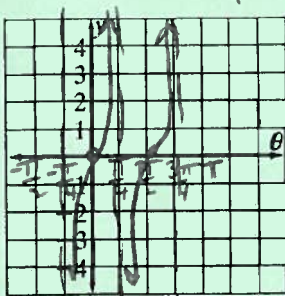
$\frac{-\pi}{2} \cdot \frac{2}{\pi}$ VA: 1, 3, 5
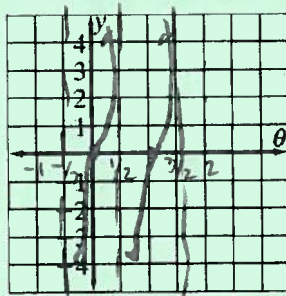
6. $y = \tan \pi\theta$ period = 1

$\frac{\pi}{2\pi} = \frac{1}{2}$ VA: $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2},$

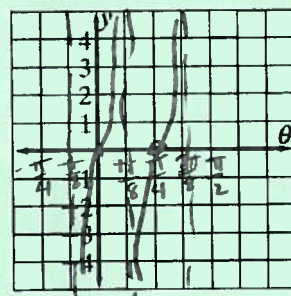$\frac{11}{2}$

Sketch two cycles of the graph of each function.

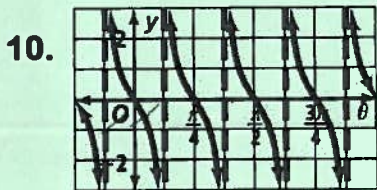**7.** $y = \tan 2\theta$ $P = \frac{\pi}{2}$ $\frac{-\pi}{4}$ to $\frac{\pi}{4}$

8. $y = \tan \pi\theta$ $P = 1$ $\frac{-\pi}{2\pi} = -\frac{1}{2}$ to $\frac{1}{2}$
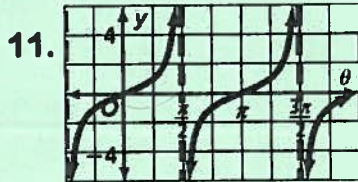

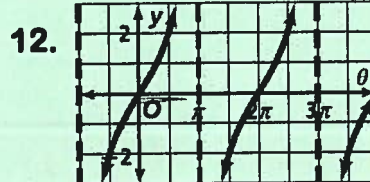**9.** $y = \tan 4\theta$ period = $\frac{\pi}{4}$ $\frac{\pi}{2(4)} = \frac{\pi}{8}$

Identify the period of each tangent function.

10.

period: $\frac{\pi}{4}$

11.

$\frac{3\pi}{2} - \frac{\pi}{2} = \pi$

period: π

12.

period: 2π

Find each value. If the tangent is undefined at that point, write *undefined*.

θ	$-\frac{\pi}{2}$	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$
$\tan\theta$	und	-1	0	1	und

13. $\tan\frac{\pi}{2}$

undefined

14. $\tan\left(-\frac{3\pi}{4}\right) = 1$

$\tan\theta$

16. $\tan\left(-\frac{\pi}{4}\right)$

-1

17. $\tan\frac{3\pi}{2}$ undefined