Name:_____ Date:_____

M12P HW Section 5.4 Graphing Tangent Functions with Transformations

$$y = AtanB(x - C) + D \ , \quad p = \frac{\pi}{B}, \quad \text{and} \quad \frac{\pi}{p} = B$$

1. What is the period of a tangent function? $y = tanx$

2. What do the constant "A" , "B", "C" and "D" do in a tangent function?

3. Where are the asymptotes of a tangent function? $y = tanx$. Why are there vertical asymptotes at these locations? Explain:

4. Where are the "X" intercepts located in a tangent function? $y = tanx$. Where are the "X" intercepts located in relation to the Vertical asymptotes?

5. If we are given the equation: $y = tan2x$, where are the vertical asymptotes located? Provide a general formula for all the vertical asymptotes? Provide a general formula for all the "X" intercepts as well.

6. If we are given the equation: $y = tan3x$, where are the vertical asymptotes located? Provide a general formula for all the vertical asymptotes? Provide a general formula for all the "X" intercepts as well.

7. If we are given the equation: $y = tan2(x - \frac{\pi}{3})$, where are the vertical asymptotes located? Provide a general formula for all the vertical asymptotes? Provide a general formula for all the "X" intercepts as well.

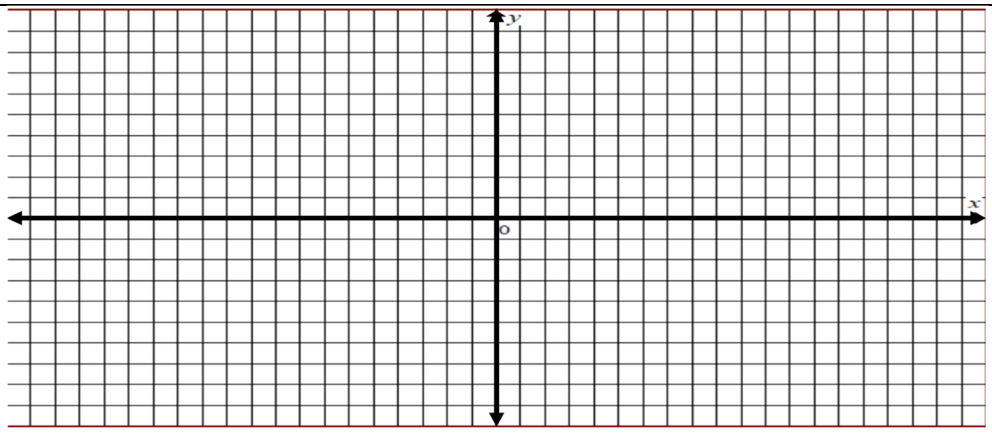
8. Is a tangent function an “ODD” or “EVEN” function? How can you tell? Explain?

9. When graphing a tangent function with a horizontal reflection, what transformation can we make to simplify the equation? Explain: Ie: $y = 5\tan\left(-\pi\left(\theta - 7\right)\right) + 1$

10. Suppose we are graphing the function: $y = 3tan\left(x - \frac{\pi}{3}\right) + 4$, at which points do the tangent function intersect the horizontal line $y = 4$? Explain:

11. What are the main steps involved in graphing a tangent function with transformation? What are the first few steps? How would you apply the constant “A”, “B”, “C”, and “D”? Explain:

12. For each of the following equations, find the constants “A” , “B”, “C” and “D”. Then indicate the transformations involved. Indicate where the asymptotes are and provide a general equation for all the Vertical Asymptotes. Indicate the coordinates of where the tangent function intersects the line $y = D$? State the period, amplitude, domain, and range: Graph the function. Label the coordinates of all the Max and Min points on your graph.

$y = 2\tan\frac{1}{2}\left(\theta - \frac{\pi}{2}\right) + 1$ A: B C: D: Vertical Asymptotes : Points in between the Asymptotes: Period : Domain : Range :	

$y = 4\tan\frac{1}{3}(\theta - \pi) - 2$

A: B

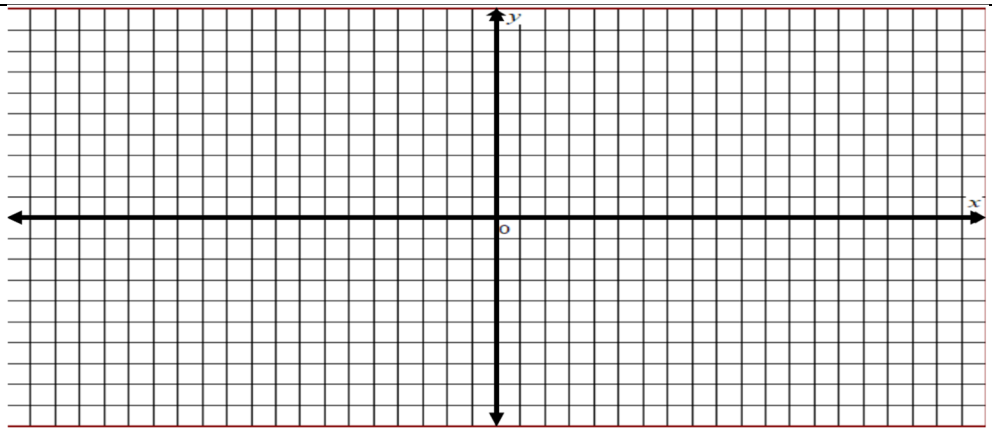
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = 5\tan\frac{-\pi}{3}(\theta + 4) - 1$

A: B

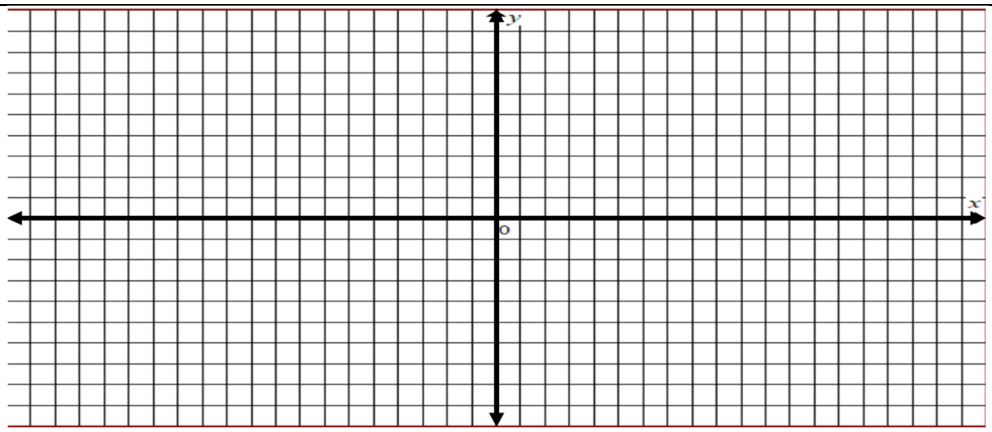
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = -2\tan\frac{-3}{2}\left(\theta - \frac{\pi}{3}\right) + 3$

A: B

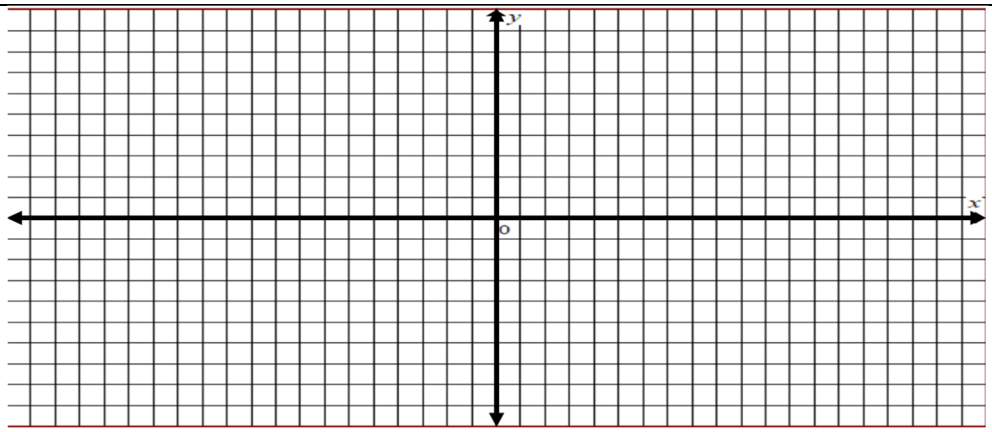
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = 5\tan\frac{\pi}{3}(\theta - 2) - 1$

A: B

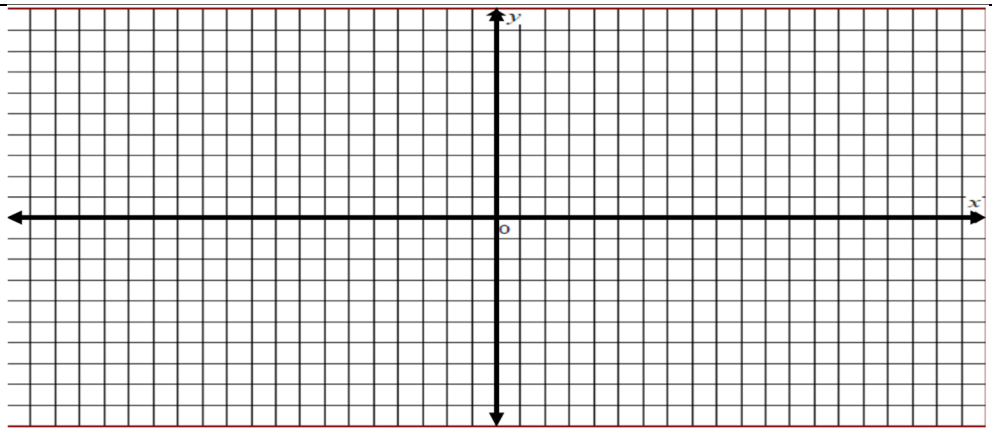
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = 2\tan\frac{\pi}{4}(\theta + 3) - 3$

A: B

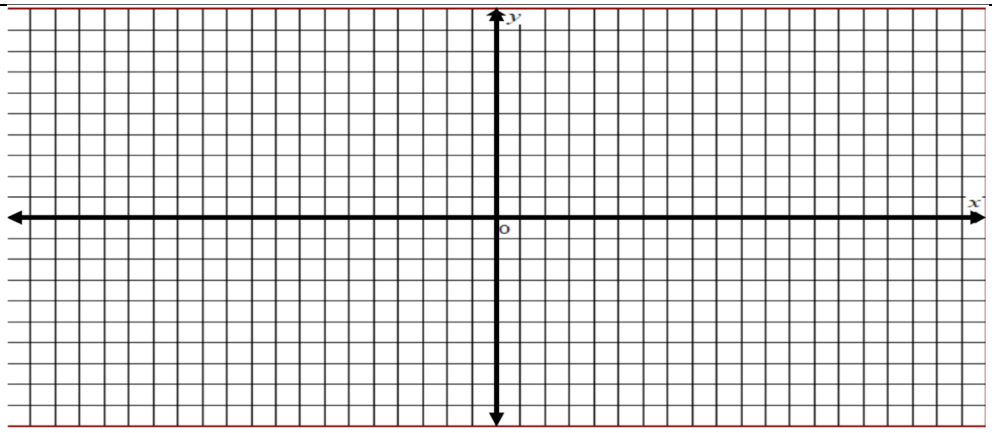
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = 5\tan\left(\pi - \frac{2\theta}{3}\right) - 2$

A: B

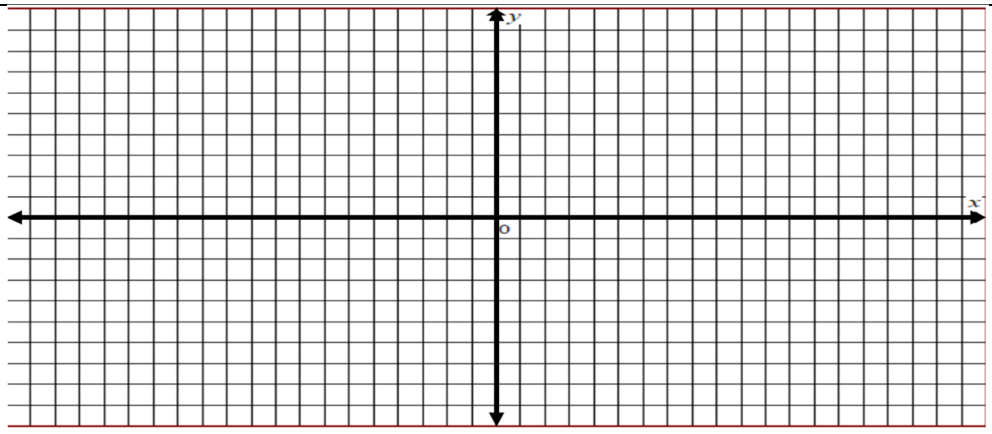
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :



$y = 4.5\tan\pi\left(\frac{4}{3} - 4\theta\right) - 1$

A: B

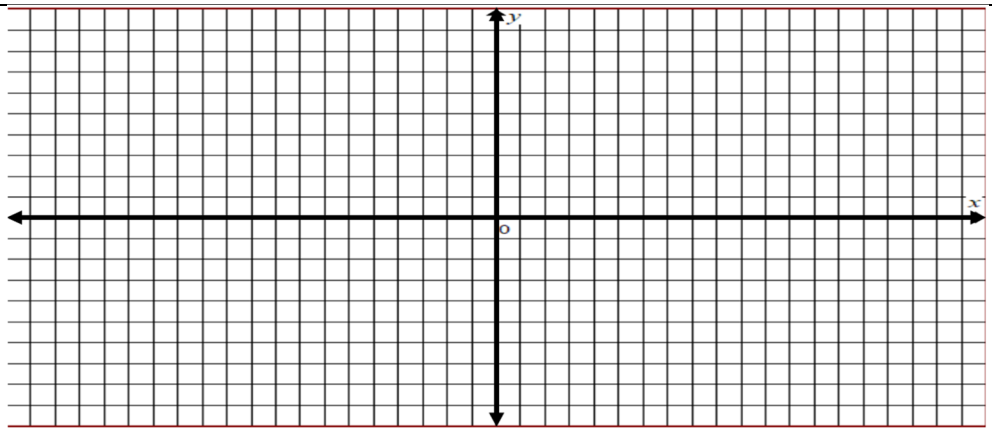
C: D:

Vertical Asymptotes :

Points in between the Asymptotes:

Period :

Domain : Range :
:



13. Indicate the Period and the number of cycles between 0 and 2pi. Find all the "x" intercepts for $0 \le \theta \le 2\pi$.
Show all your work and steps:

i) $y = 3\tan 2\theta + 4$

ii) $y = -4\tan 3\left(\theta + \frac{\pi}{2}\right) - 9$

iii) $y = 4\tan\frac{3\pi}{2}\left(\theta + \frac{\pi}{2}\right) - 11$

iv) $y = -12\tan 3\left(\theta + \frac{2\pi}{5}\right) + 7$