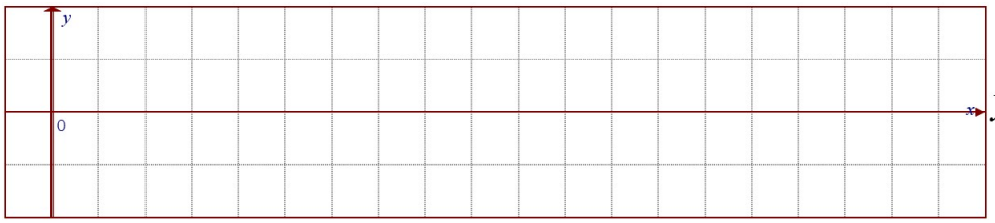
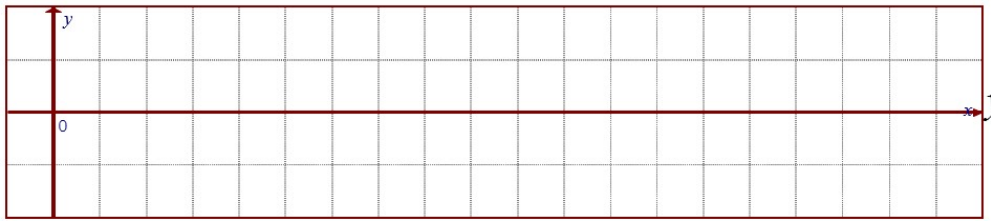
Name:_____ Date:_____

Section 4.6 Graphing Sine Cosine and Tangent Functions

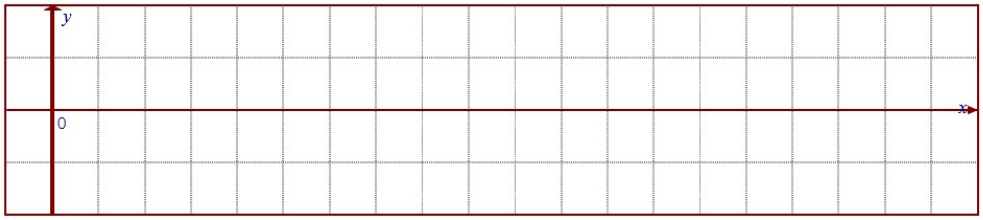
1. Graph two periods of the Sine / Cosine / and Tangent function from $0 \le \theta \le 4\pi$. Label and set the increments on the X/Y-axis, write a general formula for all the x-intercepts, vertical asymptotes (if any). Indicate the period, amplitude, domain, and range of each graph.



$y = \sin\theta$

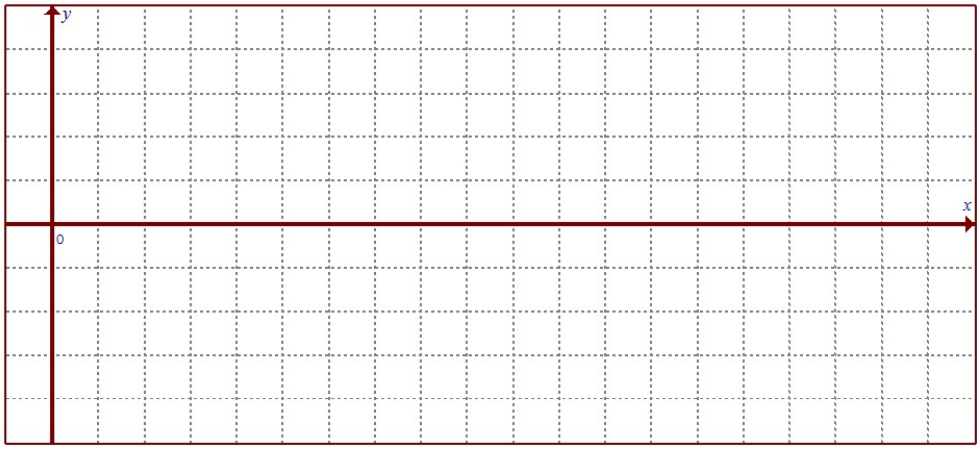


$y = \cos\theta$

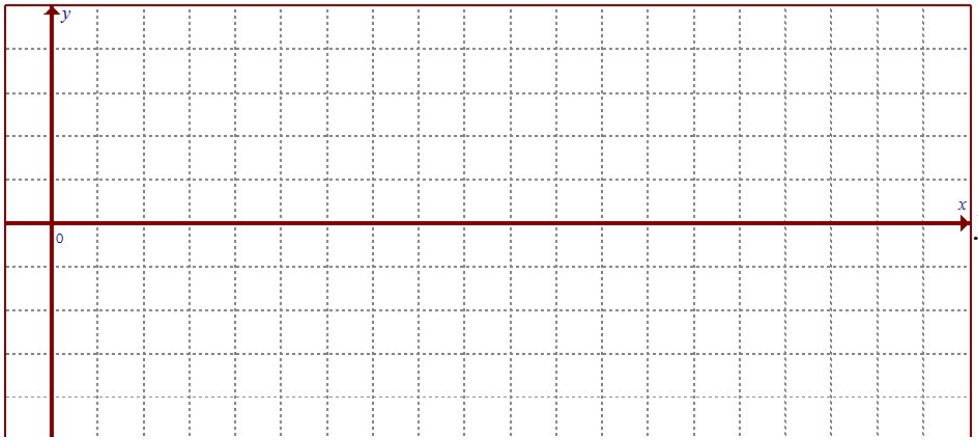


$y = -\sin\theta$

$y = -\cos\theta$



$y = \tan\theta$



$y = -\tan\theta$

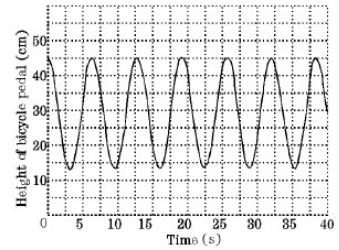
2. When the graph of $y = \sin x$ and $y = \cos x$ are drawn on the same graph for $0 < x < 2\pi$ in which quadrants do they intersect? What are the coordinates of the points of intersection?

3. Given that $\sin\theta > 0$ and $\cos\theta < 0$, what is the range of possible values of θ if $0 < \theta < 2\pi$?

4. Indicate TRUE or FALSE: $\sin\theta > 0$ and $\cos\theta > 0$, then $\tan\theta$ can be either positive or negative.

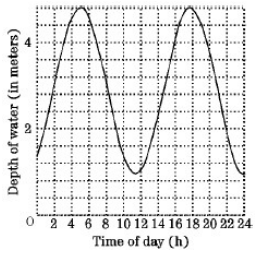
5. Given each of the following trigonometric graphs, indicate the amplitude and period

a)



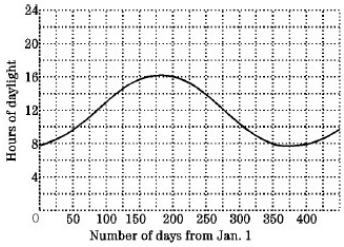
Period= Amplitude=

b)



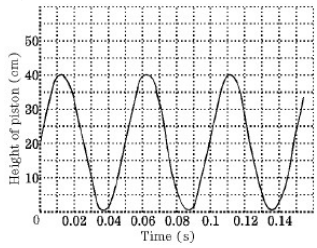
Period= Amplitude=

c)



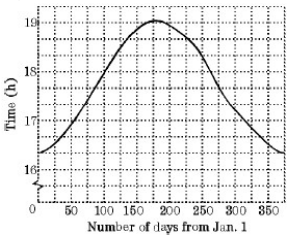
Period= Amplitude=

d)



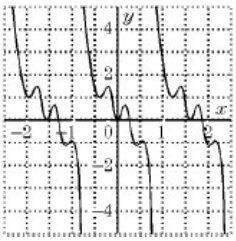
Period= Amplitude=

e)



Period= Amplitude=

f)



Period= Amplitude=

6. How do the intersections of $y = \sin x$ and $y = \cos x$ relate with the graph of $y = \tan x$?

7. How many units should the graph of $y = \sin x$ be shifted horizontally so that it will overlap the graph of $y = \cos x$?

8. When the graph of $y = \sin x$ and $y = 0.5$ are drawn on the same graph for $0 < x < 2\pi$ in which quadrants do they intersect? What are the coordinates of the points of intersection?

9. What is the amplitude and period of the graph $y = A\sin(Bx)$ if $A = -3$ and $B = 2$?

10. Given that the terminal arm intersects the unit circle at coordinates (a,b), what is the reference angle and the angle in standard position?

11. If point "P" is on the unit circle with coordinates defined by $(\sin\theta, \cos\theta)$, what is θ in standard position?

12. Given the identity $\sin 2a = 2\sin a \times \cos a$, what is the value of $\sin 2d$ if $\cos d = \frac{3}{4}$ and "d" is in quadrant 1? Find the exact value.

13. If $\cos\theta = \frac{a^2 - b^2}{a^2 + b^2}$ and $0° \le \theta \le 90°$, find the value of $\sin\theta$:

a) $\frac{2ab}{a^2 + b^2}$ b) $\frac{4ab}{a^2 + b^2}$ c) $\frac{2a^2b^2}{a^2 + b^2}$ d) $\frac{4a^2b^2}{a^2 + b^2}$ e) $\frac{a^2b^2}{2a^2 + 2b^2}$

14. If $0° \le \theta \le 180°$ and $\sin\theta \ge \cos\theta$, then:

a) $0 \le \theta \le 45°$ b) $45° \le \theta \le 90°$ c) $45° \le \theta \le 180°$ d) $90° \le \theta \le 180°$ e) $0 \le \theta \le 90°$

15. $\cos(270° - \theta) =$

a) $-\cos\theta$ b) $\cos\theta$ c) $-\sin\theta$ d) $\sin\theta$ e) $\sin\theta\cos\theta$

16. If $\sin 2a < 0$, $\cos a - \sin a < 0$, which quadrant is angle a in?

a) I b) II c) III d) IV

17. In ΔABC, $2\cos B\cos A = \sin C$. What kind of shape is the triangle?

a) Right triangle b) Equilateral triangle c) 45-45-90 triangle d) Isosceles triangle

18. $0 < \beta < 2\pi$ what does β need to be in order for $\sin\beta > \cos\beta$ to be true?

A. $\frac{\pi}{4} < \beta < \frac{\pi}{2}$ and $\pi < \beta < \frac{5}{4}\pi$ B. $\frac{\pi}{4} < \beta < \pi$

C. $\frac{\pi}{4} < \beta < \frac{5}{4}\pi$ D. $\frac{\pi}{4} < \beta < \pi \; and \; \frac{5}{4}\pi < \beta < \frac{3}{2}\pi$

19. Angle A, B are both acute angles. Point P has coordinates (cosB-sinA, sinB-cosA) Which quadrant is point P in?

a) I b) II c) III d) IV

20. sinα>sinβ Which of the following is true?

a) If α,β are in the quadrant I, then cosα>cosβa

b) If α,β are in the quadrant II, then tanα>tanβ

c) If α,β are in the quadrant III, then cosα>cosβ

d) If α,β are in the quadrant IV, then tanα>tanβ

21. A rectangle PQRS has side PQ on the x-axis and touches the graph of $y = k\cos(x)$ at the point "S" and "R" as shown. If the length of PQ is $\frac{\pi}{3}$ and the area of the rectangle is $\frac{5\pi}{3}$, what is the value of "k"?