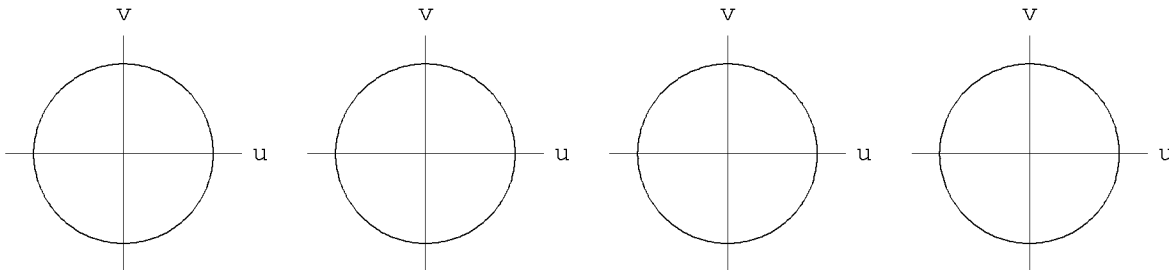


Name _____ raw scaled percent

Math 11 Trimester 2 Exam 1 (200 points)
Trigonometry

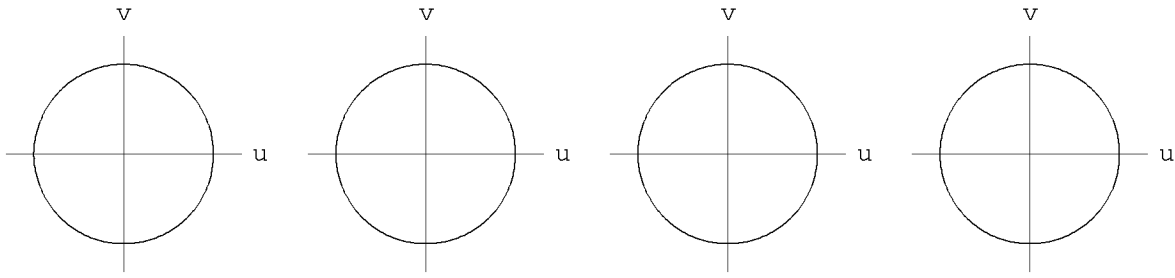
- Partial credit may be given for correct work. Therefore, it is to your advantage to write clear solutions. If I cannot understand a solution within 90 seconds, then it will receive no partial credit.
- Answers must be completely simplified. No denominators may include radicals. All fractions reduced. Arithmetic must be completely performed; e.g. write 9 instead of $\sqrt{81}$.
- All angles you write for answers must be written with respect to the angle zero and measured in the positive direction (counter clockwise). For example, write $\theta = \frac{3\pi}{2}$ rather than $\theta = -\frac{\pi}{2}$.
- No calculators. All answers must be exact.
- All are 10 points.



- A. Find the values of the following.

[1] $\cos \frac{-7\pi}{6}$

[2] $\cos \frac{5\pi}{2}$

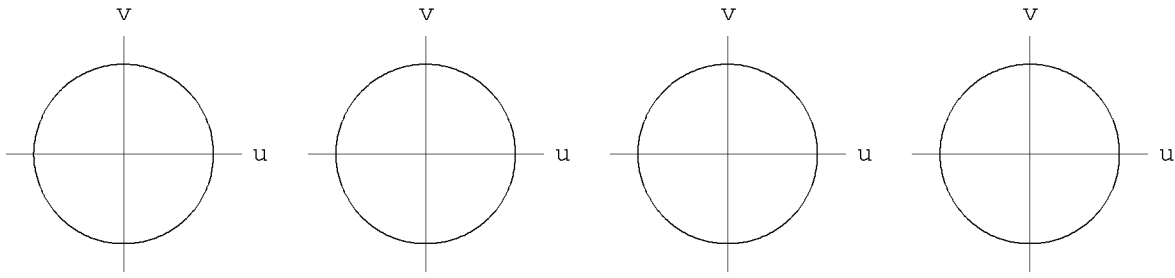


[3] $\sin \frac{5\pi}{4}$

[4] $\sin \frac{11\pi}{6}$

[5] $\sin \frac{-3\pi}{4}$

[6] $\tan \frac{-4\pi}{3}$

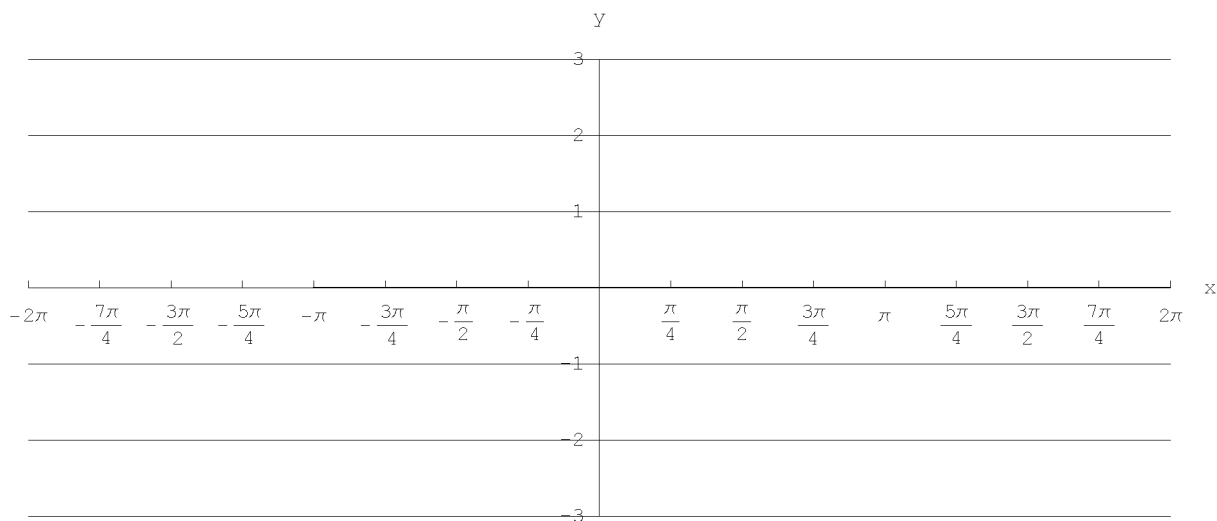


[7] Find all values of x for which $\sin x = \frac{-1}{2}$.

[8] Find all values of x , $0 \leq x < 2\pi$, for which $\cos x \leq \frac{-\sqrt{2}}{2}$

■ B1. Graph the following (neatly). Show one full period of the function. Then and answer the questions following the graph.

[1] The secant function

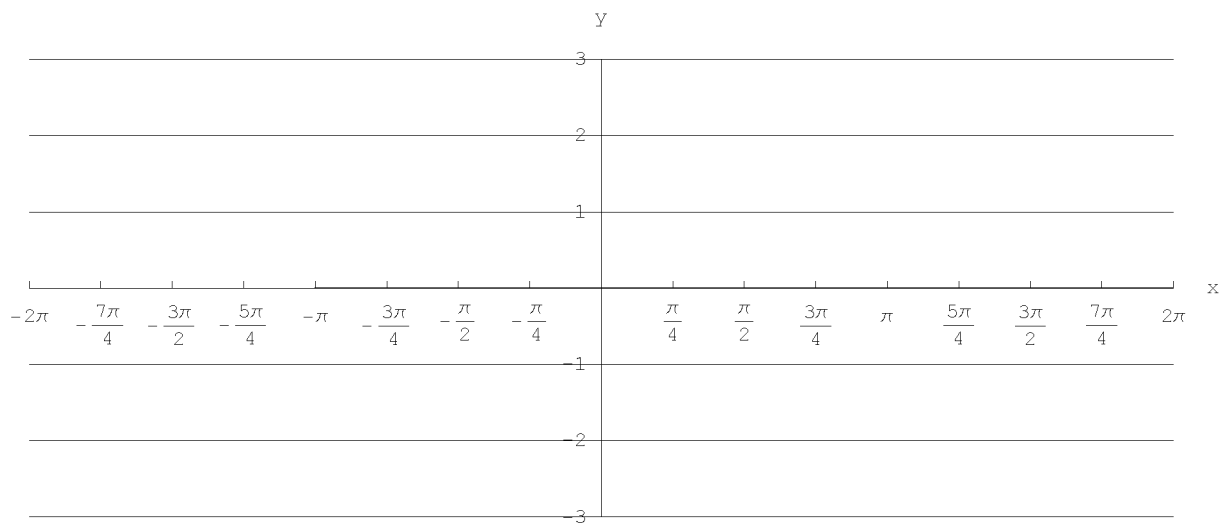


State two asymptotes of the secant function.

1.

2.

[2] $y = 2\sin\left(x - \frac{3\pi}{4}\right)$



State three values of x where the graph of $y = 2\sin\left(x - \frac{3\pi}{4}\right)$ intersects the x -axis.

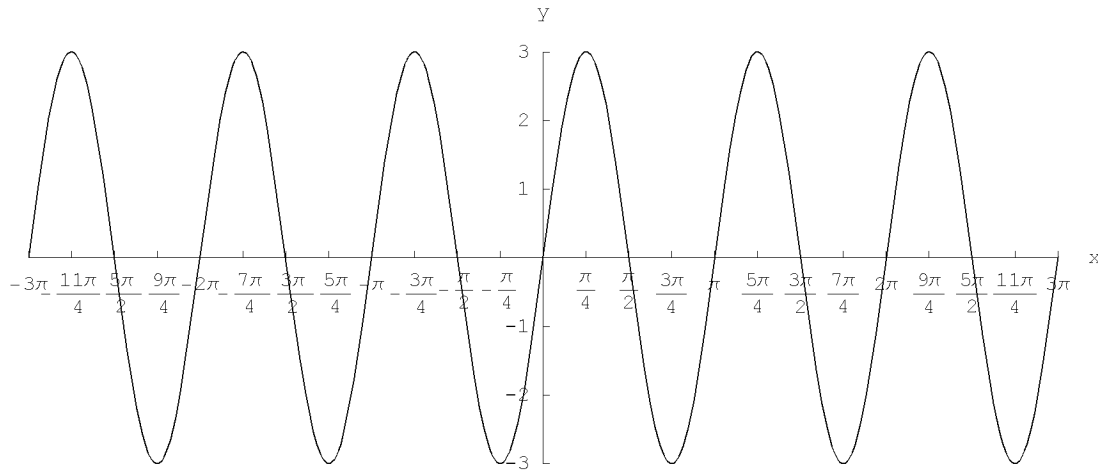
1.

2.

3.

■ B2. Write the function for each graph.

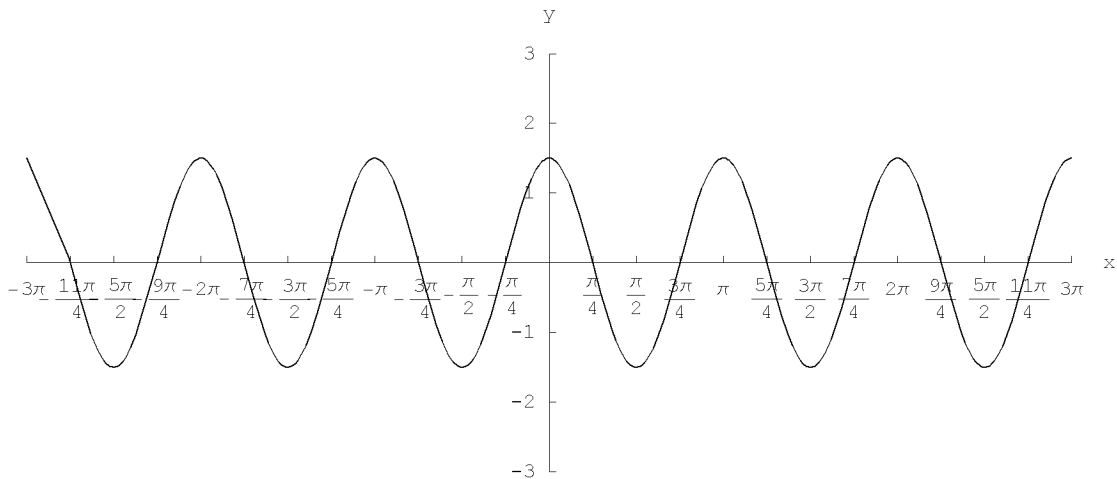
- [1] The graph crosses the x-axis at $\dots, -\pi, \frac{-\pi}{2}, 0, \frac{\pi}{2}, \pi, \dots$
It has a maximum of 3 and a minimum of -3 .



The function of graph [1] is:

Answer

[2] The graph crosses the x-axis at ..., $-\frac{3\pi}{4}$, $-\frac{\pi}{4}$, $\frac{\pi}{4}$, $\frac{3\pi}{4}$, $\frac{5\pi}{4}$,
 It has a maximum of 1.5 and a minimum of -1.5 .



The function of graph [2] is:

Answer

■ C. Proofs

[1] Prove any one of the addition theorems that involves only sines and cosines.

[2] Prove: $\cos 2\alpha = 1 - 2\sin^2\alpha$

[3] Prove: $\cos x \cos y = \frac{1}{2} [\cos(x + y) + \cos(x - y)]$

[4] Prove: $\tan(x - y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$ (Hint: start with $\tan(x - y) = \frac{\sin(x - y)}{\cos(x - y)}$ and use addition theorems.)

■ D. Find the following

[1] $\sin \frac{7\pi}{12}$

[2] $\cos \frac{5\pi}{12}$

■ E. Answer the following

[1] Find the maximum and minimum values of $y = \sqrt{2} \sin \theta + \sqrt{2} \cos \theta$ and state the values of θ , $0 \leq \theta < 2\pi$, at which they occur.

[2] Solve for x , if $13\sqrt{3} \tan 2x - 17 = 12\sqrt{3} \tan 2x - 16$