Math 1330 Test 3 Review

Where: CASA Testing Center(s) – Look in your confirmation email

Time: 50 minutes

Questions: 12 Multiple Choice + 3 Free Response = Total 15

Points: 72 for Multiple Choice Part + 28 Free Response = Total 100

What is covered: **Chapter 5, Section 6.1/6.2**

What to bring: **Cougar card**

Make up Policy: ***NO MAKE-UPS!***

Plan to be at the testing center 10-15 minutes before your scheduled time. If you are late, then try to reschedule through your CASA account.

If you miss your test, you will get a zero for the test.
Your Final exam score will replace ONE lowest score test grade.
No calculators allowed during the test!

How to study:

- Make sure you do understand all the concepts covered.
- Solve ALL problems on this review sheet.
- Take Practice Test 3 BEFORE your test.
  It is for practice AND extra credit.
  10% of your best score will be added to your Test 2 score.
- Know how to write COMPLETE answers to free response problems.
- Know the Unit Circle!

There will be **a formula sheet** available during the exam. It is your responsibility to locate it before starting the exam. If you can't find the link for it, ask proctors for help. A copy of it is on the next page so you know what to expect on the test.

Math 1330 – Formula Sheet

$$\sin(s+t) = \sin s \cos t + \sin t \cos s$$
$$\sin(s-t) = \sin s \cos t - \sin t \cos s$$

$$\cos(s+t) = \cos s \cos t - \sin s \sin t$$
$$\cos(s-t) = \cos s \cos t + \sin s \sin t$$

$$\tan(s+t) = \frac{\tan s + \tan t}{1 - \tan s \tan t}$$
$$\tan(s-t) = \frac{\tan s - \tan t}{1 + \tan s \tan t}$$

$$\sin(2t) = 2 \sin t \cos t$$
$$\cos(2t) = cos^2 t - sin^2 t$$

$$\sin\left(\frac{s}{2}\right) = \pm\sqrt{\frac{1-\cos s}{2}} \qquad \cos\left(\frac{s}{2}\right) = \pm\sqrt{\frac{1+\cos s}{2}} \qquad \tan\left(\frac{s}{2}\right) = \frac{\sin s}{1+\cos s}$$

1. Evaluate the following trigonometric functions:

a) $\sin\left(\frac{32\pi}{3}\right)$

b) $\cos\left(\frac{41\pi}{6}\right)$

c) $\tan\left(\frac{63\pi}{4}\right)$

d) $\cot\left(\frac{81\pi}{4}\right)$

e) $\sin\left(-\frac{25\pi}{6}\right)$

f) $\cos\left(\frac{19\pi}{2}\right)$

g) $\sin(9\pi)$

h) $\tan\left(\frac{25\pi}{4}\right)$

i) $\cos(61\pi)$

j) $\sin\left(\frac{41\pi}{2}\right)$

k) $\sin\left(\frac{27\pi}{2}\right)$

l) $5\cos(72\pi) + 4\sin(25\pi) + \cos\left(\frac{45\pi}{2}\right)$

2. Evaluate the following inverse trigonometric functions:

a) $\arcsin\left(\frac{\sqrt{3}}{2}\right)$

b) $\arccos\left(-\frac{1}{2}\right)$

c) $\arctan(-1)$

d) $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$

e) $cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

f) $\arcsin\left(-\frac{1}{2}\right)$

g) $\arctan\left(-\sqrt{3}\right)$

h) $\arccos\left(-\frac{\sqrt{2}}{2}\right)$

i) $\arctan\left(\frac{\sqrt{3}}{3}\right)$

j) $\arcsin\left(\frac{1}{2}\right)$

k) $\arccos\left(\frac{\sqrt{3}}{2}\right)$

l) $\arctan(0)$

3. Find the exact value of the following composed functions.
   If undefined, state *undefined.*

   a) $\sin\left(cos^{-1}\left(\frac{3}{5}\right)\right)$

   b) $\tan\left(\arcsin\left(\frac{8}{17}\right)\right)$

   c) $\cot\left(sin^{-1}\left(\frac{12}{13}\right)\right)$

   d) $\sec\left(\arccos\left(\frac{15}{17}\right)\right)$

   e) $\cos\left(tan^{-1}\left(\frac{12}{5}\right)\right)$

   f) $\csc\left(\arccos\left(\frac{4}{5}\right)\right)$

4. Find the periods of the following trigonometric functions.

a) $f(x) = 2\sin(5x + 3\pi) - 4$

b) $f(x) = -3\cos\left(3\pi x - \frac{\pi}{2}\right) + 1$

c) $f(x) = 5\tan(\pi x - 1)$

d) $f(x) = 4\sec(5\pi x - \pi) + 12$

e) $f(x) = 6\csc(4x - 2\pi) + 11$

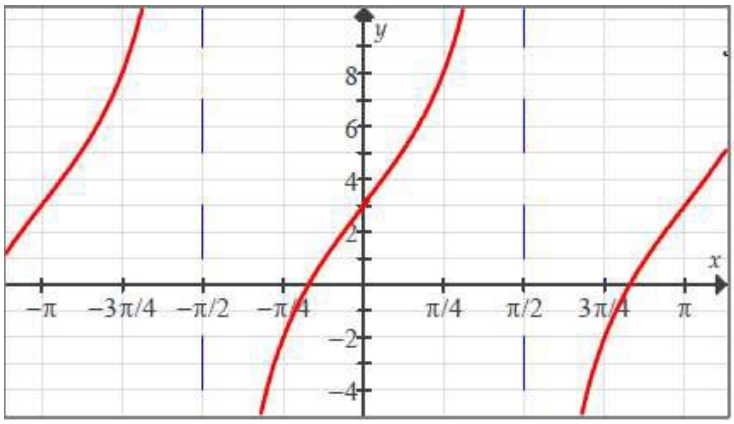
5. Give an equation of the form $f(x) = A\cos(Bx - C) + D$ or $f(x) = A\sin(Bx - C) + D$ which satisfies the following description:

a) It is a sine function whose amplitude is 5, the horizontal shift is 2 units to the left, vertical shift is 3 units down, and the period is $\frac{\pi}{8}$.

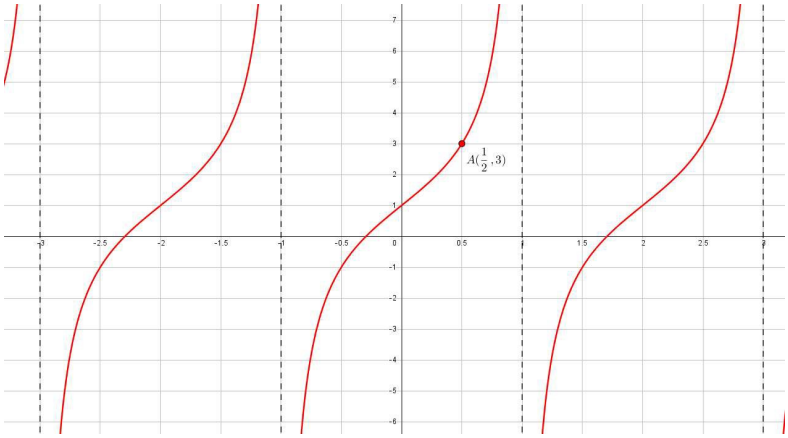
b) It is a cosine function whose amplitude is 6, the horizontal shift is 4 units to the right, vertical shift is 4 units up, and the period is $\frac{\pi}{6}$.

6. Give an equation of the form $f(x) = A\tan(Bx - C) + D$ that could be represented by the following graph:

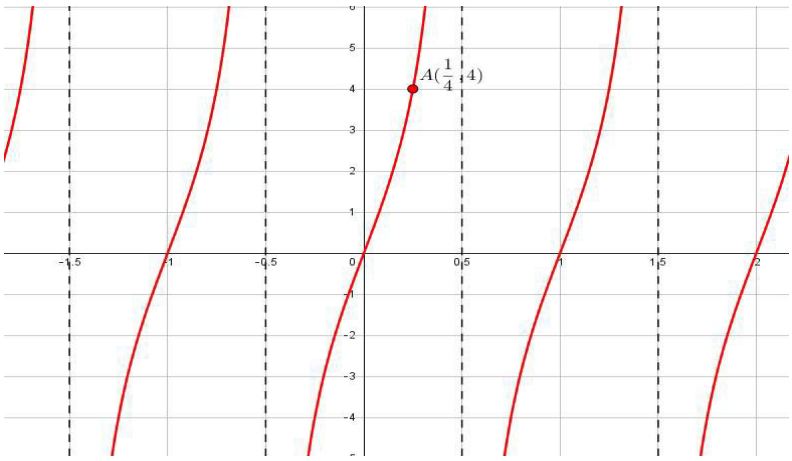
a) .



b) .

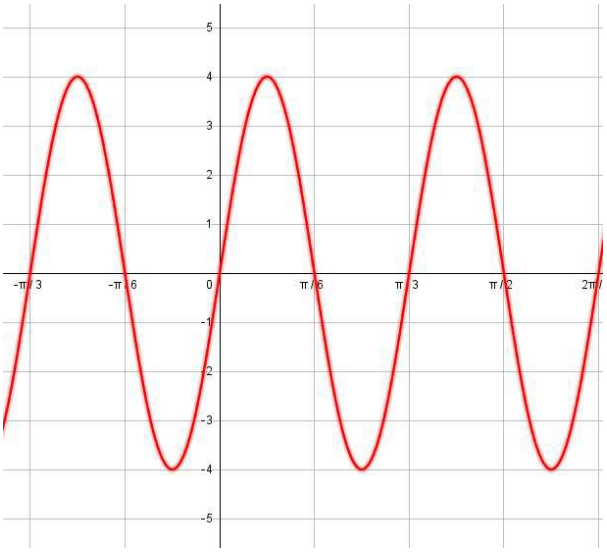


c) .

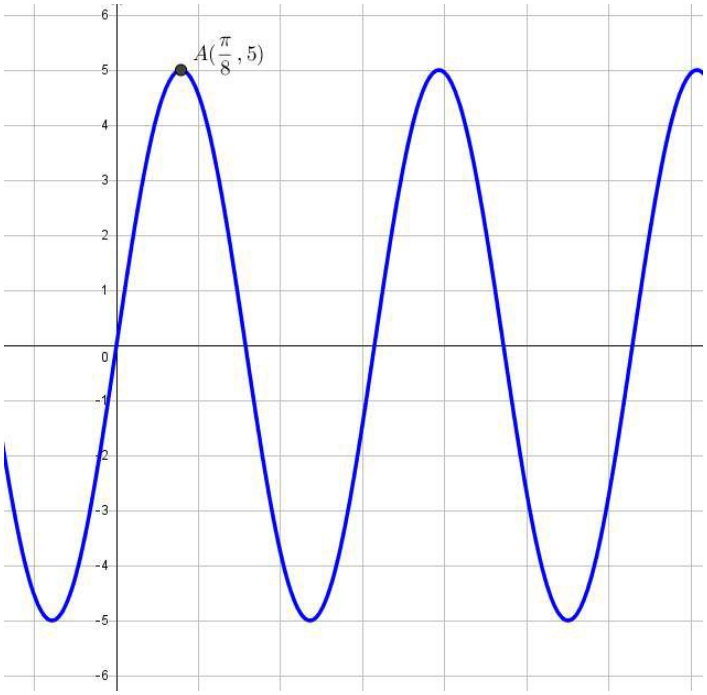


7. For the following graph give an equation of the form $f(x) = A\sin(Bx - C) + D$ that could represent the graph.

a) .



b) .



8. Given that $\cos(x) = \frac{2}{5}$ and $0 < x < \frac{\pi}{2}$, find the following:

a) $\cos(2x)$

b) $\sin(2x)$

9. Given that $\tan(x) = 10$ and $0 < x < \frac{\pi}{2}$, find $\sin(2x)$.

10. Given that $\sin(x) = \frac{15}{17}$ and $0 < x < \frac{\pi}{2}$, find the following:

a) $\sin\left(x + \frac{\pi}{4}\right)$

b) $\sin\left(x - \frac{\pi}{6}\right)$

c) $\cos\left(x + \frac{\pi}{4}\right)$

d) $\cos\left(x - \frac{\pi}{3}\right)$

11. Given that $\sin(x) = \frac{4}{5}$ and $\cos(y) = \frac{12}{13}$ where $0 < x, y < \frac{\pi}{2}$, evaluate $\sin(x - y)$.

12. Simplify the following expressions:

a) $\frac{40 \sin x \cos x}{30cos^2(x) - 30sin^2(x)}$

b) $\frac{5cos^2(x) + 5sin^2(x)}{16 \sin x \cos x}$

c) $5cos^2(x) + 5sin^2(x) - 7 \tan(x) \cot(-x)$

d) $30 \sin(-t) \cos(-t)$

13. Determine whether the following are true or false:

a) _____ $\sin(-x) = \sin(x)$

b) _____ $\cos(-x) = \cos(x)$

c) _____ $1 + tan^2(t) = sec^2(t)$

d) _____ $\text{Sin}(2x) = 2\sin(x)$

e) _____ $\text{Tan}(-x) = -\tan(x)$

f) _____ $\text{Cos}(2x) = 2\cos(x) - 1$

g) _____ $sin^2(x) = 1 - cos^2(x)$

h) _____ $\text{Sin}(x + \pi) = \sin(x)$

i) _____ $\text{Cos}(x + 20\pi) = \cos(x)$

j) _____ $\tan(x + 45\pi) = \tan(x)$

14. Graph $f(x) = 2\,cos(4x)$ for one period.

a) State the period.
b) Label the x and y intercepts (if any) with ordered pairs.
c) Label the maximum value(s) (if any) with an ordered pair.
d) Label the minimum value(s) (if any) with an ordered pair.
e) State the domain of the function.
f) State the range of the function.

15. Graph $f(x) = 6\,sin(5x)$ for one period.

a) State the period.
b) Label the x and y intercepts (if any) with ordered pairs.
c) Label the maximum value(s) (if any) with an ordered pair.
d) Label the minimum value(s) (if any) with an ordered pair.
e) State the domain of the function.
f) State the range of the function.