

## Midterm: Some problems for review

The exam will be held at the Testing Center (Zabel Hall 112) from Monday 5/8 to Wednesday 5/10. The material covered is Section 6.1 - 6.4, and 10.1 - 10.4 (only up to negative angles, supplement angles, co-function identities). It is a closed book exam. You can bring the cheat sheet I handed out earlier. This sheet should not have any handwriting notes on it, except for the “plus/minus  $\pi$ ” identities. You can bring a 4” x 6” single-sided handwritten note card. The cheat sheet and the note card should be turned in together with the exam. A scientific calculator is allowed (*and you will need it!*) Graphing/ programmable/ transmittable calculators are not allowed.

You should review the homework problems, the examples given in the textbook and in the lectures. It is always a good idea to study for the exam with someone. The types of problems you may be asked on the exam include:

- Solve equations, inequalities involving the exponential functions and logarithm functions. Represent the solution analytically and numerically.
- Convert the measure of an angle into the decimal degrees, DMS, or radians.
- Determine the 6 trigonometric functions of a given angle.
- Determine the angle in a given quadrant with a given sine, cosine,...

Additional problems to practice:

- 1) Find an angle  $\theta$  such that  $\tan \theta = -\sqrt{3}$ .
- 2) Find an angle  $\theta$  such that  $\sin \theta = -1/2$ .
- 3) Find an angle  $\theta$  in Quadrant III such that  $\cos \theta = -1/2$ .
- 4) Use your calculator to estimate the following quantities up to 4 digits after the decimal point.
  - (a)  $\sin(1)$
  - (b)  $\sin(1^\circ)$
  - (c)  $\sec(17^\circ)$
  - (d)  $\cot(45)$
  - (e)  $\csc(25^\circ)$
- 5) Use suitable trigonometric identities and the table of familiar angles to find  $\tan \theta$  and  $\csc \theta$  of the following angles.
  - (a)  $\theta = -495^\circ$
  - (b)  $\theta = -\frac{17\pi}{3}$
  - (c)  $\theta = \frac{17\pi}{2}$

6) Solve the following equations. If the result is not a rational number, approximate it up to 4 digits after the decimal point.

(a)  $3 \ln(x) = 1 - \ln(x)$

(b)  $\log(x + 1) - 1 = \log(2x)$

(c)  $x \ln(x) = 2x$

(d)  $\log_2(x) = \log_{1/4}(2x) + 1$

(e)  $3^{x-1} = \left(\frac{1}{2}\right)^{x+5}$

7) Solve the following inequalities.

(a)  $2^{x^3-x} < 1$

(b)  $3^{x-1} < 2^x$

(c)  $x^2 \ln x - x \ln x \geq 0$