

## Math 150 Exam 2 Review Problem Set

Note: This exam review does not cover every topic that could be covered on your exam. It is more heavily weighted on Sections 4.5 and 5.1-5.4. Please take a look at the previous Week in Reviews for more practice problems on other sections.

1. Find the terminal points determined by the following values of  $t$ .

(a)  $t = \frac{23\pi}{6}$

(b)  $t = \frac{5\pi}{4}$

2. Determine the sign of the expression  $\sec t \csc t \tan^2 t$  in Quadrant IV.

3. Evaluate the following.

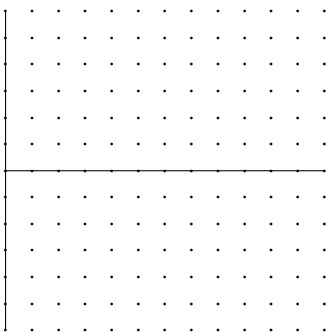
(a)  $\csc \frac{10\pi}{3}$

(b)  $\cot \frac{5\pi}{6}$

4. Find all other trig values of  $t$  if  $\csc t = -5$  and the terminal point of  $t$  is in Quadrant III.

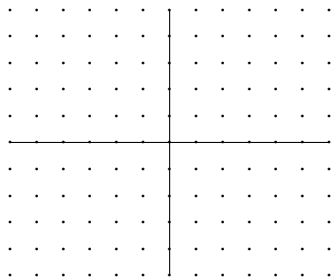
5. Express  $\sin t$  in terms of  $\cot t$  if the terminal point of  $t$  is in Quadrant IV.

6. Find the amplitude, period, and phase shift, and sketch a graph of the function  $f(x) = -3 \sin(2x - \frac{2\pi}{3})$ .

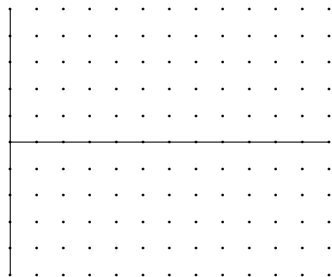


7. Find the period and sketch graphs for the following functions.

(a)  $f(x) = \tan(\frac{1}{4}(x + \pi))$



(b)  $f(x) = 2 \sec(x - \pi) + 1$



8. Suppose the amount of a radioactive substance in grams after  $t$  years is modeled by the equation  $m(t) = 25e^{-0.05t}$ .

(a) What is the half-life of this substance?

(b) At what time  $t$  will there be 5 grams remaining?

9. Solve the following equations.

(a)  $\log_{16} x + 2 \log_{16}(x - 2) - \log_{16}(3x - 4) = \frac{1}{4}$

(b)  $1 + 2^{3x-4} = 6$

10. Evaluate  $\frac{\log_4 8}{\log_4 32} \cdot (\log_4 \frac{3}{8} + \log_4 \frac{1}{6})$ .

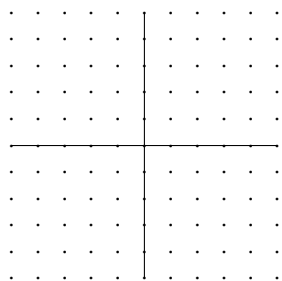
11. Find the domain and range of the following functions and describe any asymptotes.

(a)  $f(x) = -e^{x+3} - 2$

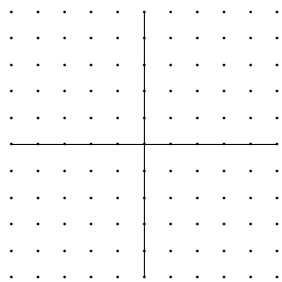
(b)  $f(x) = -\ln(x - 2) + 1$

12. Find the domain of the function  $f(x) = \log_9(-x^2 - 2x + 24)$ .

13. Graph the polynomial  $P(x) = 2(x - 1)^2(x + 2)(x - 3)$ .



14. Graph the rational function  $r(x) = \frac{3x^2 - 27}{x^2 + 3x - 4}$ .



15. Find ALL zeros, both real and nonreal, for the following polynomials. Then, factor the polynomial completely.

(a)  $P(x) = x^3 + 5x^2 - 12x - 60$

(b)  $P(x) = x^4 - x^3 - 6x^2 + 15x - 9$

16. Simplify the expression:  $\frac{(2 + \sqrt{-4})(-1 - 3i)}{-2 + 5i}$ .

17. How many positive or negative real zeros are possible for the polynomial  
 $P(x) = 5x^5 - 4x^4 - 2x^3 + 6x^2 - 8x + 17$ .

18. Find the quotient and remainder for  $\frac{x^4 - 4x^3 - 5x^2 - 4}{2x^2 + 4x - 6}$ .