

Math 1150: Midterm 3 Practice

1. Simplify the expression $\log_2(48) - \log_2(3)$.
2. Solve for x : $\log_3(2x - 4) + \log_3(x + 1) = 2$.
3. Solve for x : $\log_5(3x - 4) = \log_5(x + 2) + 1$.
4. Expand the expression completely: $\ln\left(\frac{(2x + 3)^{3/2}}{\sqrt{x}}\right)$.
5. Solve the equation for x : $e^{2x} - 7e^x + 10 = 0$.
6. A bacteria culture grows exponentially, increasing from 150 to 600 individuals in 3 hours. Write an exponential growth function for the population and determine the predicted population after 5 hours.
7. Convert 135° to radians.
8. Find the degree measure of an angle whose radian measure is $\frac{9\pi}{10}$.
9. Determine all coterminal angles of $\theta = 2$ radians that lie between -2π and 2π .
10. Find the reference angle for 245° .
11. Find the reference angle for -170° .
12. The terminal side of angle in standard position passes through the point $(-8, -6)$. Find $\sin(\theta)$ and $\cos(\theta)$.
13. A circular garden has a radius of 30 meters. If a pathway covers one-third of the circle's circumference, what is the length of the pathway?
14. Simplify the following expression: $\frac{1 - \sin^2 x}{\sin x \cos x}$.
15. Compute $\cot\left(\frac{2\pi}{3}\right)$.
16. Find the area of a sector with a central angle of $\frac{\pi}{3}$ radians in a circle with a radius of 10 cm.
17. Find the area of a sector with a central angle of 50° in a circle with a radius of 8 cm.
18. In a right triangle, if $\cos(\theta) = \frac{5}{13}$ for an acute angle θ , find $\sin(\theta)$.
19. Suppose $\cot(\theta) = -\frac{5}{3}$ and that θ is in the fourth quadrant. Find the exact values of $\sin(\theta)$, $\cos(\theta)$, $\tan(\theta)$, $\csc(\theta)$, and $\sec(\theta)$.