

MA 16010 Quiz 1 (Lesson 1)

Write your name, section number (399 for 8:30, 418 for 9:30), and quiz number on the top of your quiz, **front and back**.

You may use a one-line calculator.

1. Express the following as sums, differences, and multiples of basic logarithmic functions and constants, such as $\ln(x)$, $\ln(y)$, 3, $\ln(2)$, ...

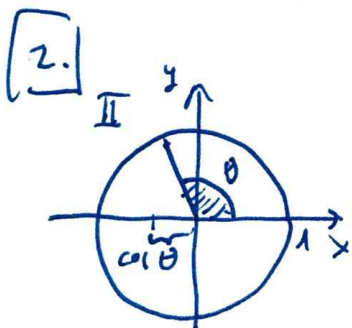
(a) $\ln\left(\frac{\sqrt[3]{x^2y}}{5\sqrt{z^7}}\right)$ (b) $\ln\left(\frac{e^4}{xy}\right)$ (c) $\ln\left(e^{\ln(e^3)}\right)$

2. Given that θ is an angle in the second quadrant such that $\sin(\theta) = 12/13$, find the exact values of $\cos(\theta)$, $\cot(\theta)$ and $\sec(\theta)$.

1. (a) $\ln\left(\frac{\sqrt[3]{x^2y}}{5\sqrt{z^7}}\right) = \ln\left(\frac{x^{2/3} y^{1/3}}{5 \cdot z^{7/2}}\right) = \frac{2}{3}\ln(x) + \frac{1}{3}\ln(y) - \ln(5) - \frac{7}{2}\ln(z)$

(b) $\ln\left(\frac{e^4}{xy}\right) = \ln(e^4) - \ln(x) - \ln(y) = 4 - \ln(x) - \ln(y)$

(c) $\ln\left(e^{\ln(e^3)}\right) = \ln(e^3) = 3$



$\Rightarrow \cos \theta < 0$

Also $\cos^2 \theta + \sin^2 \theta = 1 \Rightarrow \cos \theta = \pm \sqrt{1 - \sin^2 \theta}$

$\Rightarrow \cos \theta = -\sqrt{1 - \sin^2 \theta}$ since $\cos \theta < 0$.

So $\cos \theta = -\sqrt{1 - \frac{12^2}{13^2}} = -\sqrt{\frac{169 - 144}{169}} = -\sqrt{\frac{25}{169}} =$

$= -\frac{5}{13}$

Then $\cot(\theta) = \frac{\cos \theta}{\sin \theta} = \frac{-5/13}{12/13} = -\frac{5}{12}$, $\sec(\theta) = \frac{1}{\cos \theta} = \frac{1}{-5/13} = -\frac{13}{5}$.