AP Calc AB

Lesson 9

8/10/15

Agenda: 8/10/15
- HW leader:
- Lesson 9
  Log review
- Work on PS 9, 10

★ Quiz 1 on Friday

Period 3: Ivan Maestro

Period 4: Mitchell Bryant

T/F The domain of the function $g(z) = \frac{\sqrt{z+2}}{z-5}$ is $\{z \in \mathbb{R} \mid z \geq -2\}$.

Logarithms Review

- Any positive number can be written as any positive base raised to some power

$$N = b^a \quad \text{[Exponential form]}$$

Define:

$$\log_b N = a \quad \text{[logarithic form]}$$

) Two ways to write the same thing

Common logarithm: $\log_{10} 42$ but write $\log 42$

Natural logarithm: $\log_e 42$ but write $\ln 42$

Properties:

- $\log_b(a^x) = x \cdot \log_b a$
- $\log_b(b) = 1$
- $\log_b(a \cdot c) = \log_b a + \log_b c$
- $\log_b\left(\frac{a}{c}\right) = \log_b a - \log_b c$

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Ex 9.10 Solve for x: $\log_x(6x-9) = 2$

$6x - 9 = x^2$ [Exponential form]

$x^2 - 6x + 9 = 0$

$(x-3)^2 = 0$

$x = 3$

Check:
$\log_3(6(3)-9)$
$= \log_3(9)$
$= \log_3(3^2) = 2$ ✓

- Domain for $f(x) = \log_b(x)$ is all positive numbers.
- Domain for $f(x) = b^x$ is $\mathbb{R}$.

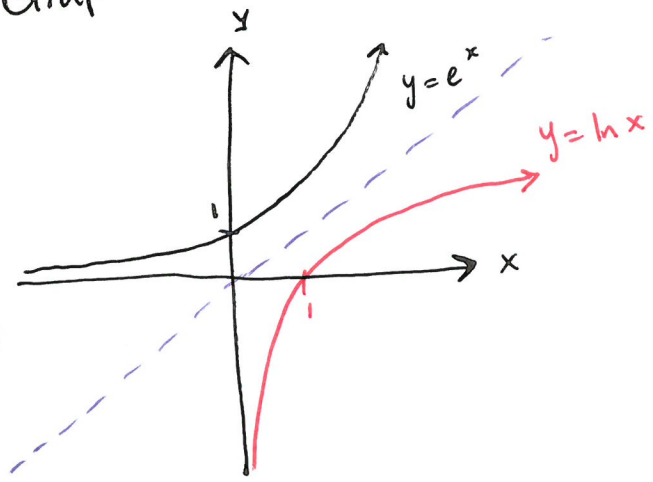
Ex. Solve: $\log_{1/3} P = 2 + \log_{1/3} 4$

$\log_{1/3}\left(\frac{P}{4}\right) = 2$ [Properties of logs]

$\frac{P}{4} = \left(\frac{1}{3}\right)^2$ [Exponential form]

$\boxed{P = \frac{4}{9}}$

Graphs:



Graph $f(x) = \ln|x| = \begin{cases} \ln x & \text{if } x > 0 \\ \ln(-x) & \text{if } x < 0 \end{cases}$