MTH 30: Final Exam Review

Part 2: Trigonometric Functions
Exponential and Logarithmic Functions

Find the values of trigonometric functions

- If $\sin\theta = \frac{2}{5}$, and $0 \le \theta \le 90^\circ$, find the remaining trigonometric functions (without using a calculator).

Simplify your answer, rationalize denominator if needed (i.e. there should be no radicals in the denominator).

Find the values of trigonometric functions

- Find the exact value of each expression.

Do not use calculator. Use reference angles, properties of odd and even functions, tables.

(a) $\cos 240^\circ$

(b) $\sin\left(-\frac{\pi}{6}\right)$

(c) $sec\left(-\frac{2\pi}{3}\right)$

Find the values of trigonometric functions

- Find the exact value of each expression. Do not use a calculator.

(a) $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

(b) $\cos\left(\cot^{-1}\left(\sqrt{3}\right)\right)$

Verify given identities

(a) $\cot x \, sec \, x \sin x = 1$

(b) $\cos\left(x + \frac{3\pi}{2}\right) = \sin x$

Solving trigonometric equations

Solve the given equations for θ from interval $[0, 2\pi)$

(a) $7\cos(3\theta)+9=-2\cos(3\theta)$

(b) $3\tan^2\theta-9=0$

Re-write the logarithms in exponential form

- $\log_6 x = 16$

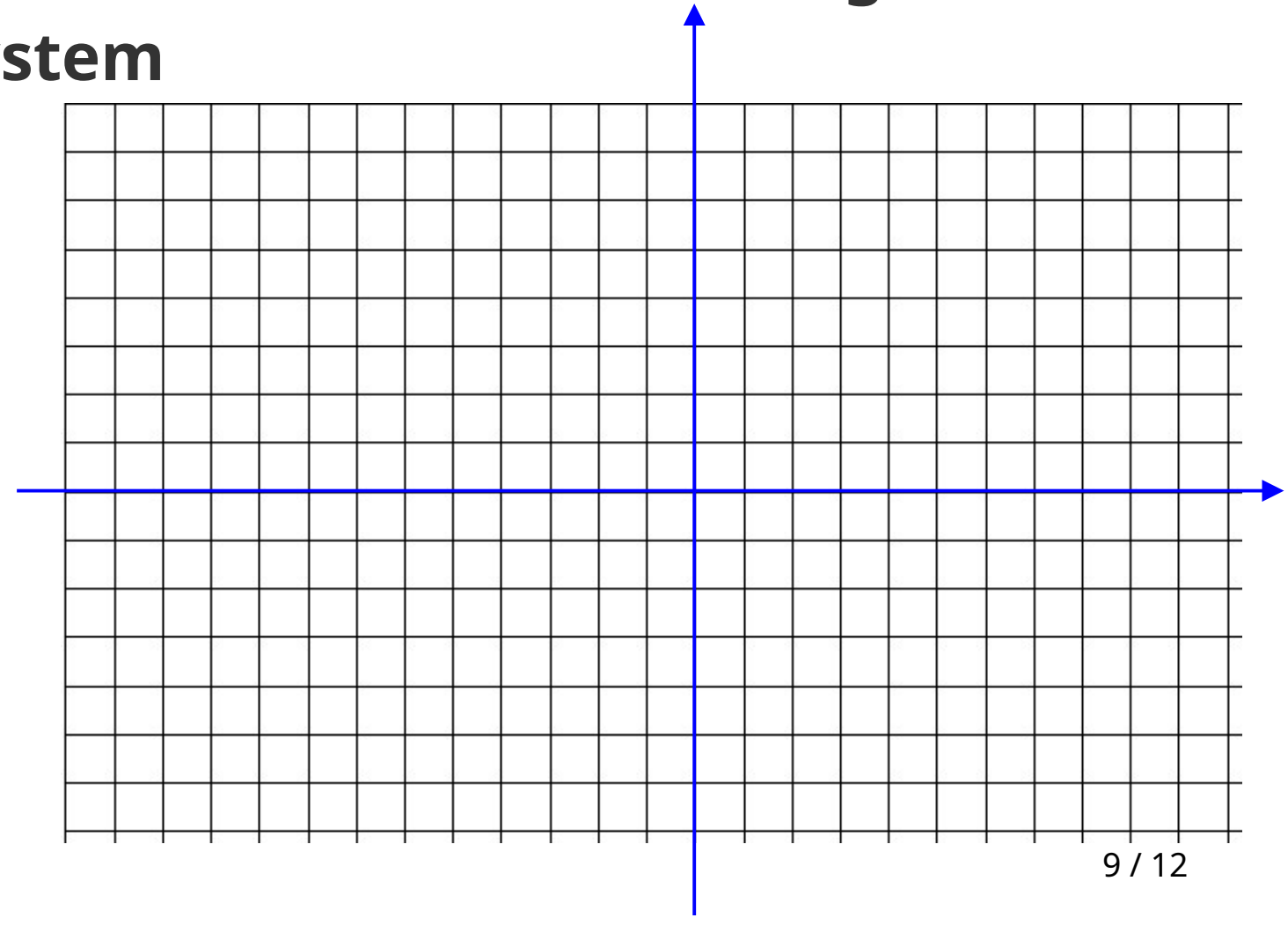
- $\log_{\frac{1}{2}} a = c$

Re-write the exponents in logarithmic form

- $a^{\frac{b}{2}} = 28$
- $\left(\frac{7}{k}\right)^{12} = 764$

Graph the functions in the same rectangular coordinate system

- $f(x)=4^x$
- $g(x)=\log_4 x$



Use properties of logarithms to expand each logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

- $\log_7\left(\frac{x^2 y}{49}\right)$

- $\log\left(\sqrt[3]{100\,x^2}\right)$

Use properties of logarithms to condense each logarithmic expression. Write the expression as a single logarithm with coefficient 1.

- $2\log_3 x + \log_3(x-1)$

- $\frac{1}{2}\ln(x+3) - \ln(x-2) + 3\ln x$

Solve each equation

- $\log_2(3x-8)=4$
- $\ln(x+4)-\ln(x+1)=\ln 2$
- $e^{3x+1}=245$