

MATH 114
03. 14. 2007

Name:

EXAM II

Please circle the name of your TA:

Nathan Panike

Keya Zhu

Show all your work in order to receive credit. A correct answer without any work will receive 0 credit. Partial credit will be given ONLY for results that are correct and relevant to the problem. Please write your answers neatly. Good luck!

| | |
|-----------------|--|
| P1 | |
| P2 | |
| P3 | |
| Multiple choice | |
| TOTAL | |

1. (10 points) Let $f(X) = X^4 + 2X^3 + X^2 + 8X - 12$. Given that $x = 2i$ is a zero of $f(X)$ find all the zeros of f .

$x =$ _____

2. Let $f(x) = \frac{-3x^2 + 9x + 30}{x^2 - x - 6}$. Determine the following (if none write "none").

Domain of $f(x)$

vertical asymptotes

horizontal asymptotes

x -intercept

y -intercept

Sketch the graph of $f(x)$. Label all asymptotes and intercepts.

3. (10 points) Solve for x

i) $\log_2(x - 1) + \log_2(3x + 2) = 1 + 2\log_2 x$

$x =$ _____

ii) $\left(\frac{1}{2}\right)^{-x} = \left(\frac{1}{4}\right)^{x+1}$

$x =$ _____

For each of the following questions circle **only one** answer. If you circle more than one answer you are not getting any credit, even if the right one was among your choices. There are 5 questions and each is worth 4 points. Turn page to answer the last question.

4. Find a polynomial function with zeros $-3, 1, 0$.

A. $f(X) = X^2(X - 1)(X + 3)$ B. $f(X) = X(X - 3)^3(X + 1)^2$

C. $f(X) = X(X - 3)(X - 1)$ D. $f(X) = X(X + 1)(X + 3)$

E. none of these

5. Find the vertical asymptote to the graph of $f(x) = \log_5(x + 2) - 3$.

A. $x = 2$ B. $x = -2$ C. $y = -3$ D. $x = 0$ E. none of these

6. T is directly proportional to the square root of L and inversely proportional to the square root of g . If $T = \frac{\pi}{2}$ when $L = 2$ and $g = 32$ find the constant of proportionality.

A. $k = \pi$ B. $k = \frac{\pi}{8}$ C. $k = 2\pi$ D. $k = \frac{\pi}{2}$ E. none of these

7. Evaluate without using a calculator

$$\ln(\ln(e^{-5}))$$

A. 0 B. does not exist C. e D. -5 E. none of these

There is a question on the next page!

8. Express in terms of logarithms of x , y and z the following

$$\log_7 \left(\frac{x^3 y^2}{\sqrt{z}} \right)$$

A. $x^3 + y^2 - \sqrt{z}$

B. $\frac{1}{3} \log_7 x + \frac{1}{2} \log_7 y - 2 \log_7 z$

C. $3 \log_7 x + 2 \log_7 y + \frac{1}{2} \log_7 z$

D. $\frac{3 \log_7 x \cdot 2 \log_7 y}{\sqrt{\log_7 z}}$

E. none of these
