Fall 2007

Math 110, Section:10

Exam #3

Instructor's Name:_____

Student's Name (please print):_____

By signing my name below, I agree that I am following all rules and regulations set forth by the Code of Academic Integrity. Furthermore, I agree that I am following all rules set by my instructor and by the course policy for this exam. This includes ensuring that all calculator programs except possibly EVALUATE and QUADRATIC FORMULA have been deleted.

Signature:_____ Date:_____

Formulas

$$A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$$

$$A = P \cdot e^{r \cdot t}$$

Multiple Choice Section

Question 1: Given the function $y = \dfrac{2x^2 + 5}{x - 3}$ which of the following statements are true

    i)   The function has x=-3 as an asymptote

    ii)   the function has y=2 as an asymptote

    iii)   the function has $y = 2x + 6$ as an asymptote

    iv)   The function has exactly one vertical asymptote

A: i and iv only   B: iii and iv only   C: ii, iii and iv only

     D; i and iii only   E: all of them are true

Question 2: The number of miles per gallon, M, for an experimental engine is given by

$M = \dfrac{2000x}{1000 + x^2} + 5$ where x is the speed of the car in miles per hour $10 \le x \le 60$ Using your

calculator determine which speed yields the greatest mileage

A: About 60 mph   B: About 10 mph   C: about 32 mph

         D: about 37mph   E: There is no max

Question 3: If Steve knew an investment yielded 7.5% annual interest compounded every two months and he wanted it to be worth $10,000 is 8 years, how much would he have to invest now (rounded to the nearest penny)?
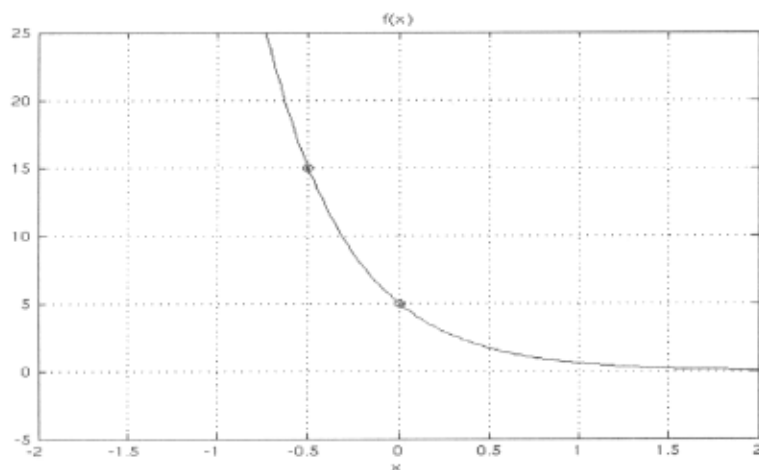
A: $5607.02   B: $5508.56   C: $ 5488.73   D: $ 5498.37   E: none of these

Question 4: The exponential function in the following graph is modeled by $y=k\cdot b^x$ What are the values for k and b.

A: $y=5\cdot(1/9)^x$ B: $y=3\cdot 5^x$ C: $y=5\cdot(1/3)^x$ D: $y=5\cdot 5^x$ E: None of these

Question 5: Given the function $f(x)=\dfrac{2x}{4x-3}$ What is the inverse of the function

A: $f^{-1}(x)=\dfrac{3x}{4x-2}$ B: $f^{-1}(x)=\dfrac{2x}{4x+3}$ C: $f^{-1}(x)=\dfrac{4x-3}{2x}$

D: $f(x)=\dfrac{2x}{4x-3}$ E: None of these

Question 6: Which of the following functions is/are one to one. (Their inverses are functions)

$f(x)=\{(1,1),(1/2,6),(3,4)(7,6)\}$ $g(x)=\sqrt{x-3}$ $h(x)=5/x^2$

A: f(x) only   B: g(x) only   C: g(x) and h(x) only   D: all of them   E: none of them

Question 7: Given the following statements identify which of them must be true

i) $\log_5(x)+\log_5(35)=\log_5(35x)$

ii) $\log(x+3)-\log(3)=\log(x)$

iii) $(\log(3))^4=\log(3^4)$

A: i only   B: iii only   C: ii and iii only   D: ii only   E: none of them

Question 8: Rewrite $5^b=a$ in a logarithmic form

A: $\log_a(b)=5$ B: $\log_5(a)=b$ C: $\log_b(5)=a$ D: $\log_5(b)=a$

E: none of these

Question 9: Find the exact value of $\ln(\sqrt[6]{e^4})$

A: 1.5   B: e   C: $\dfrac{2e}{3}$ D: $\dfrac{2}{3}$ E: 1.5e

Question 10: Solve : $\log_5(x)=2$ and $\log_2(32)=w$

A: $x=\sqrt{5}$ and $w=\sqrt{32}$ B: $x=25$ and $w=5$ C: $x=32$ and $w=16$

D: $x=25$ and $w=16$ E: none of these

Short answer Section:

Question 11:Given the function $y=\dfrac{(x+1)(x-5)}{(2x-1)(x^2-6x+8)}$ find all asymptotes and intercepts (both x and y- intercepts)

Question 12: Find the inverse of the following function $f(x)=\ln(\sqrt{x})-3$

Question 13: Solve for x algebraically then use your calculator to give approximate the solution to ± 0.001

$$3^{x+1}=5^{2x-1}$$

Question 14: The population of the southern United States can be closely approximated by the exponential growth model $A=Pe^{rt}$ with r=0.0139 when t is measured in years since 1940. The population was 41.67 million people in 1940

Determine the model for the population as a function of the year

Use your model to predict the population in 1980 and 2020 to the nearest 10,000 people.

Question 15: Use the change of base formula to express $\log_{28}(32)$ in terms of log. Then use your calculator to approximate it to ± 0.001