Math 1314 - Practice Exam 3 - Fall 2019

MULTIPLE CHOICE SECTION. (5 pts each) Choose the correct answer for each question. Select one choice only. No work will be graded. No partial credit.

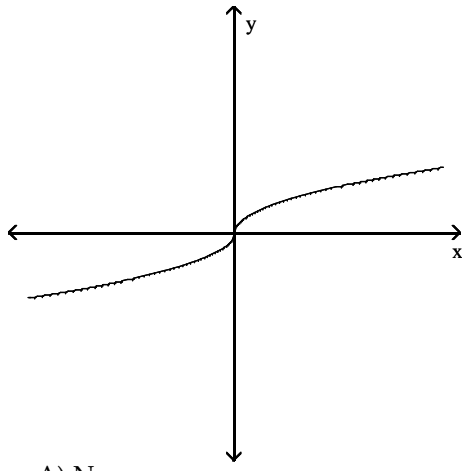
Find the inverse of the one–to–one function.

1) $f(x) = \frac{5x - 1}{3}$ 1) _____

A) $f^{-1}(x) = \frac{3}{5x + 1}$ B) $f^{-1}(x) = \frac{3}{5x - 1}$ C) $f^{-1}(x) = \frac{3x - 1}{5}$ D) $f^{-1}(x) = \frac{3x + 1}{5}$

Does the graph represent a function that has an inverse function?

2) 2) _____



A) No B) Yes

Approximate the number using a calculator. Round your answer to three decimal places.

3) $e^{-2.1}$ 3) _____

A) 0.422 B) 0.122 C) –0.122 D) –5.708

Write the equation in its equivalent exponential form.

4) $\log_6 216 = x$ 4) _____

A) $216^6 = x$ B) $6^x = 216$ C) $x^6 = 216$ D) $216^x = 6$

Write the equation in its equivalent logarithmic form.

5) $5^{-2} = \frac{1}{25}$ 5) _____

A) $\log_5 -2 = \frac{1}{25}$ B) $\log_{1/5} 5 = -2$ C) $\log_{-2} \frac{1}{25} = 5$ D) $\log_5 \frac{1}{25} = -2$

Evaluate the expression without using a calculator.

6) $\log_9 81$ 6) _____

A) 81 B) 9 C) 2 D) 18

Find the domain of the logarithmic function.

7) $f(x) = \log_9 (x + 8)$ 7) _____

A) $(8, \infty)$ B) $(-\infty, 0)$ or $(0, \infty)$ C) $(9, \infty)$ D) $(-8, \infty)$

Use properties of logarithms to expand the logarithmic expression as much as possible.

8) $\log\left(\frac{x}{100}\right)$ 8) _____

A) $\log x + 2$ B) $\log x - 2$ C) $-20x$ D) $100x$

Use properties of logarithms to condense the logarithmic expression.

9) $\frac{1}{2}\log_9 x + \log_9 y$ 9) _____

A) $\log_9 \sqrt{xy}$ B) $\log_9 \sqrt{\frac{x}{y}}$ C) $\log_9 y\sqrt{x}$ D) $\log_9 \frac{\sqrt{x}}{y}$

Solve the exponential equation. Express the solution set in terms of natural logarithms.

10) $e^{2x} = 6$ 10) _____

A) $\{3e\}$ B) $\left\{\frac{\ln 2}{6}\right\}$ C) $\left\{\frac{\ln 6}{2}\right\}$ D) $\{2 \ln 6\}$

Use properties of logarithms to expand the logarithmic expression as much as possible.

11) $\log_2 13^{-5}$ 11) _____

A) $2 \log_5 13$ B) $-5 \log_2 13$ C) $-10 \log 13$ D) $13 \log_2 5$

Solve.

12) Given that $\log_a 2 = 0.3010$ and $\log_a 3 = 0.4771$, find $\log_a \frac{9}{8}$ 12) _____

A) 0.0512 B) 2.0333 C) 0.8293 D) 0.1992

SHORT ANSWER SECTION. (5 pts each) WRITE THE ANSWER IN THE BOX. Write the FINAL ANSWER ONLY (do NOT write any work). No work will be graded. No partial credit.

Evaluate or simplify the expression.

13) $\log\left(\frac{1}{100}\right)$ 13) _____

Final answer only:

Use properties of logarithms to expand the logarithmic expression

14) $\log_b (yz^9)$ 14) _____

Final answer only:

Use properties of logarithms to condense the logarithmic expression.

15) $2\log_y 3 + \log_y 2$ 15) _____

Final answer only:

Solve the equation by expressing each side as a power of the same base and then equating exponents.

16) $3^{(3x-6)} = 27$ 16) _____

Final answer only:

ESSAY. (10 pts each) Show all work to justify your answer. Answer with no work or insufficient work will receive no credit. Partial credit may be given.

Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

17) $\log_5 x + \log_5 (x - 24) = 2$

Show all work:

Solve the exponential equation. Express the solution set in terms of natural logarithms.

18) $e^{x+8} = 3$

Show all work:

1) D
2) B
3) B
4) B
5) D
6) C
7) D
8) B
9) C
10) C
11) B
12) A
13) –2
14) $\log_b y + 9 \log_b z$
15) $\log_y 18$
16) {3}
17) {25}
18) {ln 3 – 8}