$\qquad$
$\qquad$ Date: $\qquad$

## Test \# 4 Review

## Short Answer

1. Use the One-to-One Property to solve the following equation for $x$.

$$
2^{3 x}=128
$$

2. Use the One-to-One Property to solve the following equation for $x$.

$$
\left(\frac{1}{3}\right)^{8 x-1}=27
$$

3. Rewrite the logarithmic equation $\log _{4} \frac{1}{16}=-2$ in exponential form.
4. Rewrite the exponential equation $5^{-3}=\frac{1}{125}$ in logarithmic form.
5. Evaluate the function $f(x)=\log _{3} x$ at $x=\frac{1}{27}$ without using a calculator.
6. Identify the value of the function $f(x)=\log _{10} x$ at $x=415$. Round to 3 decimal places.
7. Identify the $x$-intercept of the function $f(x)=2 \ln (x-3)$.
8. Solve the equation $\log (1-x)=\log (10)$ for $x$ using the One-to-One Property.
9. Rewrite the logarithm $\log _{3} 21$ in terms of the natural logarithm.
10. Evaluate the logarithm $\log _{7} 42$ using the change of base formula. Round to 3 decimal places.
11. Simplify the expression $\log _{5} 150$.
12. Find the exact value of $\log _{8} \sqrt[3]{64}$ without using a calculator.
13. Simplify the expression $\log _{3}\left(\frac{1}{27}\right)^{4}$.
14. Find the exact value of $\log _{4} 36-\log _{4} 9$ without using a calculator.
15. Condense the expression $7(\log x-\log y)$ to the logarithm of a single term.
16. Condense the expression $\log _{3} x+\log _{3} 4$ to the logarithm of a single term.
17. Condense the expression $\frac{1}{5}\left[\log _{4} x+\log _{4} 7\right]-\left[\log _{4} y\right]$ to the logarithm of a single term.
18. Determine whether or not $x=\frac{6}{7}$ is a solution to $3^{6 x-3}=81$.
19. Solve $\left(\frac{1}{5}\right)^{x}=125$ for $x$.
20. Solve the system by the method of substitution.

$$
\left\{\begin{array}{l}
x-y=-19 \\
x^{2}-y=1
\end{array}\right.
$$

21. Solve the system by the method of elimination.

$$
\left\{\begin{aligned}
-7 x-9 y & =-33 \\
9 x-y & =55
\end{aligned}\right.
$$

22. Solve the system by the method of elimination.

$$
\left\{\begin{aligned}
\frac{8}{5} x+\frac{1}{5} y & =-\frac{9}{5} \\
8 x+y & =-9
\end{aligned}\right.
$$

23. Solve using any method.
$\left\{\begin{aligned}-5 x+3 y & =-6 \\ y & =x-1\end{aligned}\right.$
24. Determine which one of the ordered triples below is a solution of the given system of equations.
$\left\{\begin{array}{r}4 x+y+2 z=13 \\ 8 x+3 y+6 z=35 \\ 6 x+4 y-2 z=22\end{array}\right.$
25. Find $x$ and $y$.

$$
\left[\begin{array}{cc}
-3 & x \\
y & 1
\end{array}\right]=\left[\begin{array}{cc}
-3 & 2 \\
5 & 1
\end{array}\right]
$$

26. Find $x$ and $y$.

$$
\left[\begin{array}{ccc}
x+2 & 6 & 8 y \\
1 & -2 x & 6 \\
-1 & y-1 & 6
\end{array}\right]=\left[\begin{array}{ccc}
-x+6 & 6 & -24 \\
1 & -4 & 6 \\
-1 & -4 & 6
\end{array}\right]
$$

27. If possible, find $A-B$.

$$
A=\left[\begin{array}{cc}
-3 & 0 \\
-6 & -7
\end{array}\right], B=\left[\begin{array}{cc}
-7 & 8 \\
5 & 6
\end{array}\right]
$$

28. If possible, find $2 A-5 B$.

$$
A=\left[\begin{array}{ccc}
-1 & 9 & -4 \\
3 & 6 & 4
\end{array}\right], B=\left[\begin{array}{ccc}
-4 & 8 & -6 \\
2 & 0 & 5
\end{array}\right]
$$

29. Evaluate the expression.

$$
\left[\begin{array}{cc}
0 & -4 \\
-7 & 9
\end{array}\right]+\left[\begin{array}{cc}
-4 & 0 \\
4 & 8
\end{array}\right]+\left[\begin{array}{cc}
9 & -1 \\
1 & -1
\end{array}\right]
$$

30. Evaluate the expression.

$$
\frac{1}{8}\left[\begin{array}{lll}
-5 & -1 & 2
\end{array}\right]+\left[\begin{array}{lll}
-6 & -1 & 3
\end{array}\right]
$$

31. Solve for $X$ in the equation given.

$$
3 X=-A-B, A=\left[\begin{array}{cc}
4 & 8 \\
-6 & 7
\end{array}\right] \text { and } B=\left[\begin{array}{cc}
11 & 4 \\
-9 & 8
\end{array}\right]
$$

32. Solve for $X$ in the equation given.

$$
10 A-2 B=-2 X, A=\left[\begin{array}{ccc}
2 & -7 & -4 \\
-2 & -7 & 1
\end{array}\right] \text { and } B=\left[\begin{array}{ccc}
5 & 2 & -2 \\
-1 & 1 & 2
\end{array}\right]
$$

33. If possible, find $A B$.

$$
A=\left[\begin{array}{cc}
-7 & -5 \\
-2 & 4 \\
5 & -3
\end{array}\right], B=\left[\begin{array}{l}
6 \\
4
\end{array}\right]
$$

34. If possible, find $A B$.

$$
A=\left[\begin{array}{l}
3 \\
3
\end{array}\right], B=\left[\begin{array}{cc}
-5 & -3 \\
-5 & 2 \\
3 & -2
\end{array}\right]
$$

35. Use the matrix capabilities of a graphing utility to find $A B$, if possible.

$$
A=\left[\begin{array}{ccc}
6 & -7 & -6 \\
3 & 3 & -6 \\
-2 & 4 & -6
\end{array}\right], B=\left[\begin{array}{ccc}
0 & 2 & -6 \\
5 & 7 & -1 \\
-5 & 7 & -4
\end{array}\right]
$$

36. Use the matrix capabilities of a graphing utility to find $A B$, if possible.

$$
A=\left[\begin{array}{cc}
-2 & -2 \\
7 & 2 \\
6 & 4 \\
-5 & 3
\end{array}\right], B=\left[\begin{array}{cccc}
-7 & 2 & -3 & 9 \\
7 & 7 & 4 & 6
\end{array}\right]
$$

37. Find the determinant of the matrix $\left[\begin{array}{cc}-5 & -6 \\ -8 & -3\end{array}\right]$.
38. Find the determinant of the matrix $\left[\begin{array}{cc}-\frac{3}{2} & -\frac{1}{2} \\ 6 & \frac{1}{3}\end{array}\right]$.
39. Find the determinant of $\left[\begin{array}{ccc}-3 & 1 & 0 \\ 2 & -2 & 0 \\ -1 & -8 & -1\end{array}\right]$.
40. Find the determinant of $\left[\begin{array}{ccc}0 & 2 & 2 \\ 4 & -4 & 0 \\ -2 & -16 & -6\end{array}\right]$.

## Test \# 4 Review

Answer Section

## SHORT ANSWER

1. ANS:
$\frac{7}{3}$

PTS: 1
OBJ: Solve exponential equations using one-on-one property
2. ANS:
$-\frac{1}{4}$

PTS: 1
OBJ: Solve exponential equations using one-on-one property
3. ANS:
$4^{-2}=\frac{1}{16}$

PTS: 1
OBJ: Express logarithmic equation in exponential form
4. ANS:
$\log _{5} \frac{1}{125}=-3$

PTS: 1
OBJ: Express exponential equation in logarithmic form
5. ANS:
-3

PTS: 1 OBJ: Evaluate logarithmic function
6. ANS:
2.618

PTS: 1
OBJ: Evaluate logarithmic function
7. ANS:
$x=4$

PTS: 1
OBJ: Identify x-intercept of logarithmic function
8. ANS:
-9

PTS: 1
9. ANS:
$\frac{\ln 21}{\ln 3}$

PTS: 1
OBJ: Convert logarithmic expression from one base to another
10. ANS:
1.921

PTS: 1
OBJ: Evaluate logarithm using change of base formula
11. ANS:
$2+\log _{5} 6$

PTS: 1
OBJ: Simplify logarithmic functions
12. ANS:
$\frac{2}{3}$

PTS: 1
OBJ: Evaluate logarithmic function using properties of logarithms
13. ANS:
-12
PTS: 1
14. ANS:

1
PTS: 1
OBJ: Evaluate logarithmic function using properties of logarithms
15. ANS:
$\log \left(\frac{x}{y}\right)^{7}$

PTS: 1
OBJ: Condense logarithmic function using the properties of logs
16. ANS:
$\log _{3} 4 x$

PTS: 1
OBJ: Condense logarithmic function using the properties of logs
17. ANS:
$\log _{4} \frac{\sqrt[5]{7 x}}{y}$

PTS: 1
OBJ: Condense logarithmic function using the properties of logs
18. ANS:
no
PTS: 1
OBJ: Check the solution to an exponential equation
19. ANS:
-3

PTS: 1
OBJ: Solve exponential equations
20. ANS:
$(-4,15),(5,24)$
PTS: 1 OBJ: Solve systems of equations in two variables by substitution
21. ANS:
$(6,-1)$
PTS: 1 OBJ: Solve systems of equations in two variables by elimination
22. ANS:
(a,-9-8a) (dependent)
PTS: 1 OBJ: Solve systems of equations in two variables by elimination
23. ANS:
$\left(\frac{3}{2}, \frac{1}{2}\right)$
PTS: 1
OBJ: Solve systems of equations in two variables by any algebraic method
24. ANS:
$(1,5,2)$
PTS: 1
OBJ: Determine which ordered triple satisfies system
25. ANS:
$x=2, y=5$
PTS: 1
OBJ: Understand matrix equality
26. ANS:
$x=2, y=-3$
PTS: 1 OBJ: Understand matrix equality
27. ANS:
$\left[\begin{array}{cc}4 & -8 \\ -11 & -13\end{array}\right]$
PTS: 1
OBJ: Add and subtract matrices
28. ANS:
$\left[\begin{array}{ccc}18 & -22 & 22 \\ -4 & 12 & -17\end{array}\right]$
PTS: 1
OBJ: Add and subtract matrices
29. ANS:
$\left[\begin{array}{cc}5 & -5 \\ -2 & 16\end{array}\right]$
PTS: 1
OBJ: Add and subtract matrices
30. ANS:
$\left[\begin{array}{lll}-\frac{53}{8} & -\frac{9}{8} & \frac{13}{4}\end{array}\right]$
PTS: 1 OBJ: Add and subtract matrices
31. ANS:
$\left[\begin{array}{cc}-5 & -4 \\ 5 & -5\end{array}\right]$
PTS: 1 OBJ: Solve matrix equations
32. ANS:
$\left[\begin{array}{ccc}-5 & 37 & 18 \\ 9 & 36 & -3\end{array}\right]$
PTS: 1
OBJ: Solve matrix equations
33. ANS:
$\left[\begin{array}{c}-62 \\ 4 \\ 18\end{array}\right]$

PTS: 1 OBJ: Multiply matrices
34. ANS:
not possible
PTS: 1 OBJ: Multiply matrices
35. ANS:
$\left[\begin{array}{ccc}-5 & -79 & -5 \\ 45 & -15 & 3 \\ 50 & -18 & 32\end{array}\right]$

PTS: 1
OBJ: Use graphing utilities to multiply matrices
36. ANS:
$\left[\begin{array}{cccc}0 & -18 & -2 & -30 \\ -35 & 28 & -13 & 75 \\ -14 & 40 & -2 & 78 \\ 56 & 11 & 27 & -27\end{array}\right]$

PTS: 1 OBJ: Use graphing utilities to multiply matrices
37. ANS:
-33
PTS: 1
OBJ: Find the determinant of a matrix
38. ANS:
$\frac{5}{2}$

PTS: 1
OBJ: Find the determinant of a matrix
39. ANS:
-4
PTS: 1
OBJ: Find the determinant of a matrix
40. ANS: -96

PTS: 1
OBJ: Find the determinant of a matrix

