

SEND - IN ASSIGNMENT**UNIT 4****Exponents & Logarithms**

Name: _____

Teacher: _____

If you are cross enrolled, state your other school besides DESK.

Date that you submitted this assignment:

- To receive full credit for your answers to the questions, show ALL work.

Total _____ = _____ %
58

All answers rounded to 2 decimal places unless otherwise stated.

1. Solve the following for x algebraically. Verify your solution.

a) $4^{-2x+1} = 8^{x-4}$

a) _____
2 marks

b) $9^{2x-1} = \left(\frac{1}{27}\right)^{x+2}$

b) _____
2 marks

c) $4^{x^2-x} = 1$

c) _____
2 marks

d) $\log_{3x} 36 = 2$

d) _____
2 marks

2. Evaluate: $\log_6 58$ using the change of base rule.

2. _____
1 mark

3. Change each of the following from exponential form to logarithmic form.

a) $0.2y = 5(7)^x$

a) _____
2 marks

b) $7^{2x-1} = 17^x$

b) _____
3 marks

4. Change each of the following from logarithmic form to exponential form $y = ab^x$

a) $\log_3 \frac{y}{5} = x$

a) _____
1 mark

b) $\log_{10}(0.5y) = x$

b) _____
1 mark

5. Solve the following for x. State in log form AND as a numerical value rounded to the nearest hundredth.
(3 marks each)

a) $6^{5x+1} = 4^x$

b) $7(5)^x = 8^{x+1}$

6. Evaluate the following using the laws of logarithms without a calculator.

a) $\log_5 10 + \log_5 75 - (\log_5 2 + \log_5 3)$

a) _____
2 marks

b) $\log_5 625^{1.5}$

b) _____
2 marks

7. Write each expression as a single logarithm.

a) $5 \log x - \frac{1}{2} \log y - 3 \log z$

a) _____
2 marks

b) $\frac{3}{4} \log_a b + 4 \log_a c - 3 \log_a b$

b) _____
2 marks

8. Solve for x algebraically. Verify your solutions.

a) $\log_5 x - \log_5(x - 1) = \log_5 3$

a) _____
3 marks

b) $\log_4(x - 5) + \log_4(x - 2) = 1$

b) _____
3 marks

c) $\log x = \frac{2}{3}\log 27 + 2 \log 2 - \log 3$

c) _____
3 marks

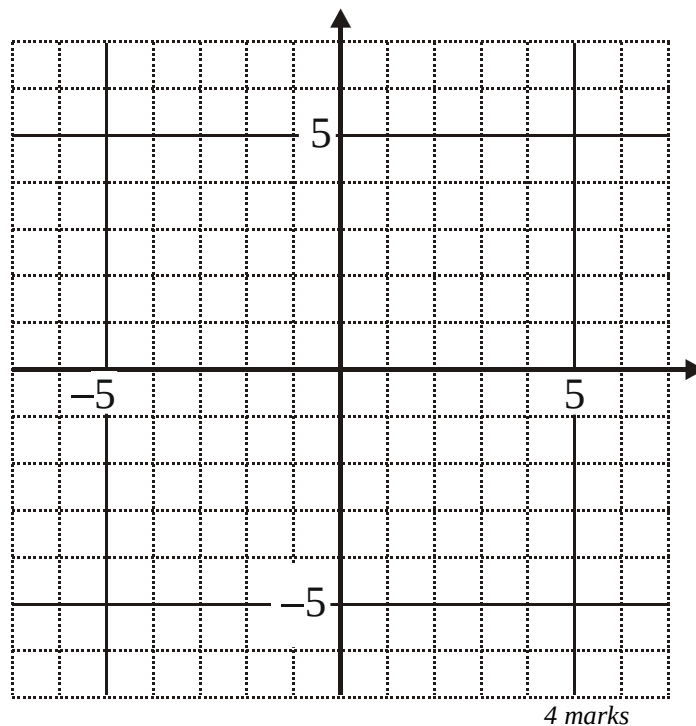
d) $2 \log_3 x - \log_3 2x = 2$

d) _____
3 marks

9. If $\log 3 = a$ and $\log 8 = b$, determine $\log 18$ in terms of a and b .

9. _____
2 marks

10. Graph $y = 2^{x+1} - 4$. Indicate the asymptote with a dotted line. Clearly show at least four points on the graph (include the intercepts). Use the space to show how you calculated the coordinates.



11. If you invest \$800 at 7.5% compounded annually, how many years (to the nearest tenth) would it take for your investment to grow to \$2000?

11. _____

2 marks

12. A colony of bees increases by 35% every four months. How many bees should a beekeeper start with if she wishes to have 10,000 bees in 18 months?

12. _____

2 marks

13. An archeologist finds a fossil that contains 60 milligrams of carbon-14. She knows that the bone originally contained 100 milligrams of carbon-14. How old is the fossil if the half-life of carbon-14 is 5,700 years?

13. _____

2 marks

14. A major earthquake of magnitude 8.7 is 150 times as intense as a minor earthquake. Determine the magnitude, to the nearest tenth, of the minor earthquake.

14. _____
2 marks

15. Determine the inverse function of $f(x) = 5^{x-7} + 3$

15. _____
2 marks