

NAME: \_\_\_\_\_

*P.I. A2.A.19: Apply the properties of logarithms to rewrite logarithmic expressions in equivalent forms*

1. Which shows the expansion of  $\log 6x^3$ ?

[A]  $\log 6 + 3\log x$       [B]  $18\log x$   
[C]  $3\log 6 + \log x$       [D]  $\log 6 + x\log 3$

Write as a single logarithm:

2.  $2\log_b x + 2\log_b y$

[A]  $\log_b \left( \frac{x^2}{y^2} \right)$       [B]  $\log_b (4xy)$   
[C]  $\log_b (x^2 y^2)$       [D]  $\log_b \left( \frac{2x}{2y} \right)$

3.  $9\log_b x + 3\log_b y$

[A]  $\log_b (x^9 y^3)$       [B]  $\log_b \left( \frac{9x}{3y} \right)$   
[C]  $\log_b (27xy)$       [D]  $\log_b \left( \frac{x^9}{y^3} \right)$

4.  $3\log_b x - 9\log_b y$

[A]  $\log_b (27xy)$       [B]  $\log_b \left( \frac{x^3}{y^9} \right)$   
[C]  $\log_b (x^3 y^9)$       [D]  $\log_b \left( \frac{3x}{9y} \right)$

5.  $7\log_b x - 7\log_b y$

[A]  $\log_b \left( \frac{x^7}{y^7} \right)$       [B]  $\log_b (x^7 y^7)$   
[C]  $\log_b (49xy)$       [D]  $\log_b \left( \frac{7x}{7y} \right)$

6. Given  $\log_z 11 = 1.338$  and  $\log_z 7 = 1.086$ , find  $\log_z 77$ .

7. Given  $\log_z 5 = 0.732$  and  $\log_z 2 = 0.315$ , find  $\log_z 10$ .

8. Given  $\log_z 5 = 0.898$  and  $\log_z 3 = 0.613$ , find  $\log_z 15$ .

9. Given  $\log_z 3 = 0.565$  and  $\log_z 2 = 0.356$ , find  $\log_z 6$ .

10. Compare the quantity in Column A with the quantity in Column B.

<u>Column A</u>	<u>Column B</u>
$\log 4x^6$	$\log 4 + 6\log y$

- [A] The quantity in Column A is greater.  
[B] The quantity in Column B is greater.  
[C] The two quantities are equal.  
[D] The relationship cannot be determined on the basis of the information supplied.

- [1] A
- [2] C
- [3] A
- [4] B
- [5] A
- [6] 2.424
- [7] 1.048
- [8] 1.511
- [9] 0.921
- [10] D