

“What do you call a person who likes to blow up bars?”

Write each expression as a single logarithm. The answer to each problem will match a letter that will allow you to figure out the joke.

1. $5\log_3 x + 7\log_3 y$

N: $\log_3 x^3 y$

2. $6\log x - 4\log y - 2\log z$

O: $\log\left(\frac{x}{x-1}\right)$

3. $3(\log_3 x - 4\log_3 y)$

L: $\log x^3$

4. $\log \frac{1}{x} + 4\log x$

O: $\log_3 x^5 y^7$

5. $20\log \sqrt[5]{x}$

S: $\log(x+1)$

6. $3\log_3 x - \log_3 \frac{1}{y}$

O: $\log \frac{y\sqrt{xy}}{z^2}$

7. $\frac{1}{2}(\log x + 3\log y) - 2\log z$

A: $\log_3 \frac{x^4}{y^2}$

8. $3(2\log_3 x - 4\log_3 y) + 2(5\log_3 y - \log_3 x)$

E: $\log \frac{x^6}{y^4 z^2}$

9. $\log_3 x - 2(\log_3 y + 3\log_3 x)$

R: $\log x^4$

10. $\log\left(\frac{x^2}{x^2-1}\right) + \log\left(\frac{x+1}{x}\right)$

B: $\log\left(\frac{x+1}{x-1}\right)$

11. $\log(x^2 + 2x + 1) - \log(x^2 - 1)$

A: $\log_3 \frac{x^3}{y^{12}}$

12. $\log(x+2) - (\log(x^2-4) - \log(x^2-x-2))$

M: $\log_3 \frac{1}{x^5 y^2}$

12

8

4

1

10

6

3

11

7

9

11

2

5