Algebra reasoning — Logarithm laws

Name: _____ Date: _____

Read each line of working and choose the answer that is correct.

1 **Spot the mistake: $\log(x^4) + \log(x^5) = 20(\log x)^2$. Which answer is right?**

$\log(x^4 + x^5)$ | 20 log x | $20(\log x)^2$ | **9 log x**

Why? the two logs were multiplied once their powers had come down.

2 **Check this line: $\log(3x) - \log 3 = \log x$. Which is correct?**

log x | log 3 − log x | log x ÷ log 3 | 3 log x

Why? .....

3 **Check this line: $\log(x^2) + \log(x^5) = 7 \log x$. Which is correct?**

$\log(x^2 + x^5)$ | 10 log x | 7 log x | $10(\log x)^2$

Why? .....

4 **Check this line: $\log(14x) - \log 14 = 14 \log x$. Which is correct?**

log x ÷ log 14 | log x | 14 log x | log 14 − log x

Why? .....

Algebra reasoning · Logarithm laws — Answer key

1. $\log(x^4) + \log(x^5) = 9 \log x$, not $20(\log x)^2$ (the two logs were multiplied once their powers had come down)

2. $\log(3x) - \log 3 = \log x$, which is what was written — this line is correct

3. $\log(x^2) + \log(x^5) = 7 \log x$, which is what was written — this line is correct

4. $\log(14x) - \log 14 = \log x$, not $14 \log x$ (the multiplier inside the log was brought down as a power)