

COUNTDOWN CHALLENGE

Logarithms

John Napier was famous for his work with logarithms, which help us multiply and divide. Logarithms and exponents are related and the exercise below will show you how. Follow the patterns to complete the Base 2 Logarithm table. To find the product of two numbers, use the table and find the log that matches each number. Add the 2 logs. The sum of the logs will correspond to the correct product in the Number column.

| Number | Log | $\times 2$ | Exponent |
|-----------|-----|-----------------------|----------|
| 1 | 0 | 0 | 2^0 |
| 2 | 1 | 2 | 2^1 |
| 4 | 2 | 2×2 | 2^2 |
| 8 | 3 | $2 \times 2 \times 2$ | 2^3 |
| 16 | 4 | | 2^4 |
| 32 | 5 | | |
| 64 | | | |
| 128 | | | |
| 256 | | | |
| 512 | | | |
| 1,024 | | | |
| 2,048 | | | |
| 4,096 | | | |
| 8,192 | | | |
| 16,384 | | | |
| 32,768 | | | |
| 65,536 | | | |
| 131,072 | | | |
| 262,144 | | | |
| 524,288 | | | |
| 1,048,576 | | | |
| 2,097,152 | | | |
| 4,194,304 | | | |

| | | |
|--------|-------------------------------------|---------|
| Number | 256×32 | = _____ |
| Log | $8 + 5$ | = _____ |
| Number | $131,072 \times 32$ | = _____ |
| Log | $17 + \underline{\hspace{1cm}}$ | = _____ |
| Number | $64 \times 64 \times 64$ | = _____ |
| Log | $6 + 6 + 6$ | = _____ |
| Number | 128^3 | = _____ |
| Log | 7 | = _____ |
| Number | $16,384 \times 8$ | = _____ |
| Log | $14 + 3$ | = _____ |
| Number | $16 \times 256 \times 1,024$ | = _____ |
| Log | $4 + \underline{\hspace{1cm}} + 10$ | = _____ |
| Number | $2,097,152 \div 1,024$ | = _____ |
| Log | $21 - 10$ | = _____ |