

Mental Mathemagician

$2^1 = 2$	$2^{11} = 2,048$	$2^{21} = 2,097,152$
$2^2 = 4$	$2^{12} = 4,096$	$2^{22} = 4,194,304$
$2^3 = 8$	$2^{13} = 8,192$	$2^{23} = 8,388,608$
$2^4 = 16$	$2^{14} = 16,384$	$2^{24} = 16,777,216$
$2^5 = 32$	$2^{15} = 32,768$	$2^{25} = 33,554,432$
$2^6 = 64$	$2^{16} = 65,536$	$2^{26} = 67,108,864$
$2^7 = 128$	$2^{17} = 131,072$	$2^{27} = 134,217,728$
$2^8 = 256$	$2^{18} = 262,144$	$2^{28} = 268,435,456$
$2^9 = 512$	$2^{19} = 524,288$	$2^{29} = 536,870,912$
$2^{10} = 1024$	$2^{20} = 1,048,576$	$2^{30} = 1,073,741,824$

Without using a calculator or paper, can you mentally compute these expressions?

1. 32×16

9. $\sqrt{65,536}$

2. $4 \times 64 \times 1024$

10. $\sqrt[3]{134,217,728}$

3. $4 \times 16 \times 32 \times 64$

11. $\sqrt[5]{1,073,741,824}$

4. $1024 \div 64$

12. $(1,048,576)^{1/2}$

5. $1,048,576 \div 32,768$

13. $(262,144)^{2/3}$

6. $1,073,741,824 \div 64$

14. $\frac{524,288}{(16,384)^{\frac{1}{2}}}$

7. 128^2

15. $\frac{(67,108,864)^{1/2}}{16^3(256)^{1/4}}$

8. $(1,024)^3$

16. $\frac{1}{4} \cdot (65,536)$