

4A.5 Learning Opportunity

Laws of Exponents



Name: _____

Use the laws of exponents to simplify each expression below, **but keep your answer in exponential form.**

1) $8^3 \cdot 8^5$

2) $2^5 \div 2^4$

3) $(3^4)^2$

4) $(q^4)^0$

5) $\frac{n^7}{n^4}$

6) $m^2 \times m^0$

7) $(8^2)^4$

8) $(g^4)(g^2)$

9) $a^2 \div a^1$

10) $9^8 \div 9^8$

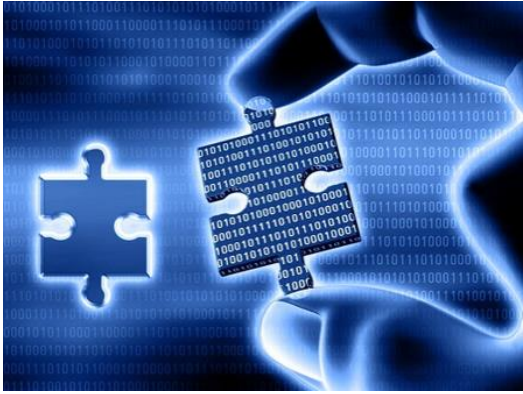
11) $2^6 \cdot 2^2$

12) $(m^2)^5$

- 13) The 100 meter dash and the 10 kilometer race are track and field events. How many times longer is a 10 kilometer race than the 100 meter dash?



- 14) Computers store information in bits. One byte is equal to 2^3 bits. A kilobyte is equal to 2^{10} bytes. How many bits are in a kilobyte? (express your answer in exponential form)



For the exercises below, find the value of each variable.

15) $2^2 \cdot 2^a = 2^5$

16) $9^8 \cdot 9^e = 9^3$

17) $6^3 \cdot 6^h = 6^4$

18) $(8^m)^2 = 8^{10}$

19) $(5^3)^d = 5^6$

20) $4^2 \cdot 4^n = 4^8$

21) $(7^x)^4 = 7^{12}$

22) $\frac{3^6}{3^w} = 3^3$

23) $5^3 (5^h) = 5^6$

24) $\frac{(8^2 \cdot 8^{10})^w}{8^3} = 8^{33}$

25) $\left(\frac{7^x}{7^5}\right)^2 = 7^2$