

Exponent Law Worksheet

Using exponent laws, reduce the following expressions to one exponent.

1. $4^6 \times 4^{12}$

2. $(9^{12})^7$

3. $(4 \times 7)^3$

Write the following as a single power and then evaluate the expression.

4. $2^5 \times 2^7$

5. $3(mn)^4$ where $m = 6$ and $n = 5$

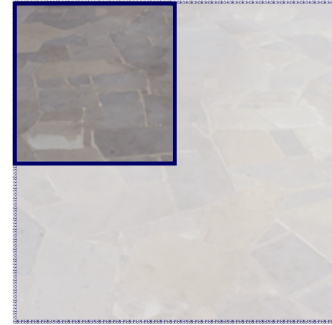
6. $8(3^5)^2$

Evaluate the following powers, then determine which expression in each set has a lesser value.

7. $2(2^2)^3$ or $3(2^3)^2$

8. $6^3 \times 6^4$ or $3^6 \times 3^6$

9. The area of Jenn's patio is 7^2m^2 . She would like to extend her patio so that its square footage is squared again. Express this equation using the power of a power law of exponents and then solve the equation.



10. Given the equation $2^x \times 2^y = 2\,048$, what are possible values for x and y ?

Exponent Law Worksheet Solutions

Using exponent laws, reduce the following expressions to one exponent.

$$1. 4^6 \times 4^{12}$$
$$= 4^{18}$$

$$2. (9^{12})^7$$
$$= 9^{84}$$

$$3. (4 \times 7)^3$$
$$= 4^3 \times 7^3$$

Write the following as a single power and then evaluate the expression.

$$4. 2^5 \times 2^7$$
$$= 2^{5+7}$$
$$= 2^{12}$$
$$= 4\,096$$

5. Solve for $3(mn)^4$ where $m = 6$ and $n = 5$

$$3(6 \times 5)^4$$
$$3 \times 6^4 \times 5^4$$
$$3 \times 1\,296 \times 625$$
$$2\,430\,000$$

6. Evaluate the expression $8(3^5)^2$

$8(3^{5 \times 2})$

$8(3^{10})$

$8(59\ 049)$

472 392

Evaluate the following powers, then determine which expression in each set has a lesser value.

7. $2(2^2)^3$

or

$3(2^3)^2$

$2(2^6)$

$3(2^6)$

$2(64)$

$3(64)$

128

192

The first expression is less than the second expression.

8. $6^3 \times 6^4$

or

$3^6 \times 3^6$

6^{3+4}

3^{6+6}

6^7

3^{12}

279 936

531 441

The first expression is less than the second expression.

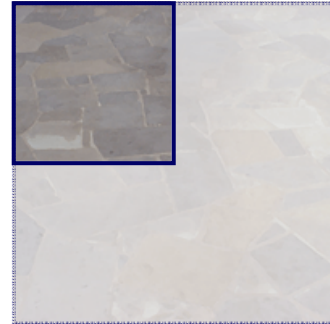
9. The area of Jenn's patio is 7^2m^2 . She would like to extend her patio so that its square footage is squared again. Express this equation using the power of a power law of exponents and then solve the equation.

$(7^2)^2 \text{ m}^2$

$7^{2 \times 2} \text{ m}^2$

7^4 m^2

$2\,401 \text{ m}^2$



10. Given the equation $2^x \times 2^y = 2\,048$, what are possible values for x and y ?

$x = 5$ and $y = 6$ or visa versa. We can determine our values by dividing 2 048 by two. If we continue that process we need to divide our answers by 2, 11 times before we reach 1. 5 plus 6 is equal to 11 which is the exponent needed to arrive at the answer 2 048.