

## 10.2 Exploring Laws of Exponents (Day 1)

### Product Rule

Complete the table below with a partner. Then answer the questions that follow.

Expression	Expanded Form	Exponential Form
$3^2 \cdot 3^5$	$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$	$3^7$
$2 \cdot 2^6$		
$b^5 \cdot b^8$		

1. Look at the table above. Compare the first and third column. Describe, using words, the relationship that you see between them.
2. Use your observations from the previous question to fill in the box and complete the math sentence below.

$$a^m \cdot a^n = a^{\boxed{\phantom{000}}}$$

3. The rule you discovered in the question above is called the "**product rule**." Use it to simplify the expressions below.

a.  $2^6 \cdot 2^8$

b.  $(-7)^3 \cdot (-7) \cdot (-7)^5$

c.  $m \cdot m^5 \cdot m^6$

## Power of a Product

Complete the table below with a partner. Then answer the questions that follow.

Expression	Expanded Form	Exponential Form
$(2 \cdot 5)^3$	$(2 \cdot 5) \cdot (2 \cdot 5) \cdot (2 \cdot 5) = 2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 5$	$2^3 \cdot 5^3$
$(3x)^4$		
$(7^2y^3z^4)^2$		

1. Look at the table above. Compare the first and third column. Describe, using words, the relationship that you see between them.

2. Use your observations from the last question to fill in the boxes and complete the math sentence below.

$$(xy)^b = x \square y \square$$

3. The law you discovered in the question above is called the "**power of a product**." Use it to simplify the questions below.

a.  $(3 \cdot 5)^7$

b.  $(17w)^2$

c.  $(2a^3b^{10})^9$