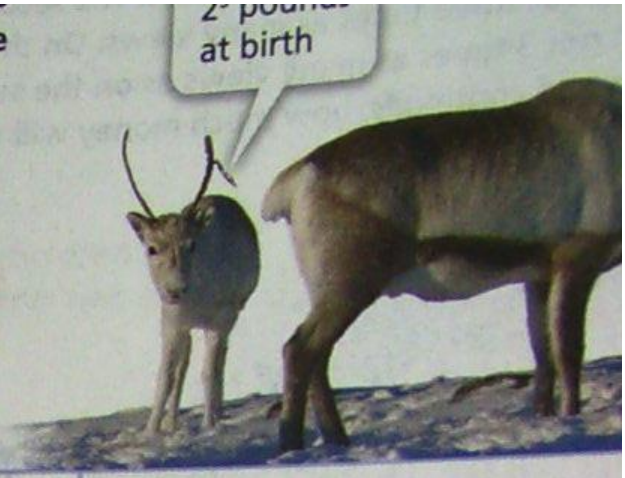
right. On average, an adult male caribou weighs up to 2^6 times more than newborn. How can you determine the average weight of an adult male caribou?



Look for Relationships How do the two weights relate? MP.7

$2^3 \cdot 2^6$

ONE WAY Write the two expressions in expanded form.

2^3 2^6

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

2 is multiplied 3 times — 2 is multiplied 6 times

Join the two expressions.

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^9$

2 is multiplied 9 times

ANOTHER WAY Use the Product Property.

$2^3 \times 2^6 = 2^{3+6} = 2^9$

The **Product of Powers Property** states that when multiplying two powers with the same base, add the exponents.

Keep the base

Try It!

The local zoo welcomed a newborn African elephant that weighed 3^4 kg. It is expected that at adulthood, the newborn elephant will weigh approximately 3^4 times as much as its birth weight. What expression represents the expected adult weight of the newborn elephant?

$3^4 \cdot 3^4$

3^8

Convince Me! Explain why the Product of Powers Property makes mathematical sense.

$\times (2 \times 12) \times (2 \times 12)$

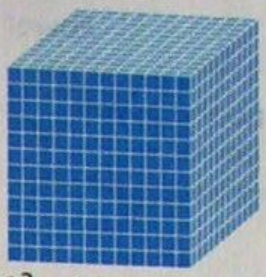
Use the Associative and Commutative Properties.

^{3}

ic inches

Use the **Power of Products Property:** when multiplying two exponential expressions with the same exponent and different bases, multiply the bases and keep the exponent the same.

1 cubic foot



12^3 cubic inches

Find the Power of a Power

t expression for $(5^2)^4$.

$5^2)$

d 4 times

Use the Product of Powers Property to add the exponents.

The **Power of Powers Property** states that to find the power of a power, multiply the exponents.

Keep the base

Divide Exponential Expressions: Same Base

t expression for $6^5 \div 6^3$.

$\frac{6^5}{6^3} = 6^2$

Write as a fraction.

ed 5 times

$\times 6 \times 6$

$\times 6$

ed 3 times

Remember, $\frac{6}{6} = 1$.

$\times 6 \times 6$

$\times 6$

The **Quotient of Powers Property** states that when dividing two exponential expressions with the same base, subtract the exponents.

Keep the base