

Evaluate a numeric exponential power. <sup>\*\*</sup> Clearly show work. Circle your answer.

1)  $2^6$

2)  $5^3$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64$$

Circle  
answer

Show this step!

Expand the power  
by showing "2"  
Six times with

mult signs between

$$5 \cdot 5 \cdot 5 =$$



$$25 \cdot 5 = 125$$

Show  
this step!!

Optional step

\*\* Evaluate numeric expressions with positive integer exponents, using the product property. Clearly show work. Simplify the exponent expression; then evaluate. Circle your answer.

1)  $5^1 \cdot 5^2$

$= 5^{1+2} = 5^3 = 125$

5 = 5<sup>1</sup>  
(+There is an implied 1)

Show this work!

Circle answer

2)  $2^4 \cdot 2^2 =$

$2^{4+2} = 2^6$  ← show this step

$= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$  ← optional step to evaluate the expression

$= 64$  ← Circle

The product property: When you multiply factors with the same base, then add the exponents.

EX]  $X^a \cdot X^b = X^{a+b}$  where "X" is the base; a, b are exponents

NAQ.c

NO CALC!

Date \_\_\_\_\_ Period \_\_\_\_\_

NAQ.c.3

must show work like below

Evaluate complex numeric expressions with whole number exponents demonstrating the ability to use the product, power, and quotient properties

Clearly show work. Simplify the exponent expression; then evaluate. Circle your answer.

$$\begin{aligned}
 1) \frac{3^7}{3^3 \cdot 3^2} &= \frac{3^7}{3^{3+2}} \\
 &= \frac{3^7}{3^5} \\
 &= 3^{7-5} \\
 &= 3^2 \\
 &= \textcircled{9}
 \end{aligned}$$

$$\begin{aligned}
 2) \frac{6^1 \cdot 6^3}{6^3} &= \frac{6^{1+3}}{6^3} \\
 &= \frac{6^4}{6^3} \\
 &= 6^{4-3} \\
 &= 6^1 \\
 &= \textcircled{6}
 \end{aligned}$$

$$\begin{aligned}
 3) (3^3)^2 &= 3^{3 \cdot 2} \\
 &= 3^6 \\
 &= \boxed{729}
 \end{aligned}$$

$$\begin{aligned}
 4) (5^2)^2 &= 5^{2 \cdot 2} \\
 &= 5^4 \\
 &= \boxed{625}
 \end{aligned}$$

$$\begin{aligned}
 5) \left(\frac{4^2}{4}\right)^4 &= \frac{4^{2 \cdot 4}}{4^{1 \cdot 4}} \\
 &= \frac{4^8}{4^4} \\
 &= 4^{8-4} \\
 &= 4^4 \\
 &= \boxed{256}
 \end{aligned}$$

$$\begin{aligned}
 6) \left(\frac{2^4}{2^2}\right)^4 &= \frac{2^{4 \cdot 4}}{2^{2 \cdot 4}} \\
 &= \frac{2^{16}}{2^8} \\
 &= 2^{16-8} \\
 &= 2^8 \\
 &= \boxed{256}
 \end{aligned}$$

NAQ.c

NO CALC!

MUST SHOW WORK LIKE  
Below ↓

Date \_\_\_\_\_ Period \_\_\_\_\_

NAQ.c.4

Evaluate complex numeric expressions with negative integer exponents, demonstrating the ability to use the product, power, and quotient properties.

Clearly show work. (1) Simplify the exponent expression using only positive exponents; (2) Evaluate and give answers as simplified improper fractions. Circle your answer.

$$\begin{aligned}
 1) \quad & 4^3 \cdot 4^{-2} \\
 & = 4^{3+(-2)} \\
 & = 4^1 \\
 & = \boxed{4}
 \end{aligned}$$

$$\begin{aligned}
 2) \quad & 3^1 \cdot 3^{-3} \\
 & = 3^{1+(-3)} \\
 & = 3^{-2} \\
 & = \frac{3^0}{3^2} \\
 & = \frac{1}{4^2} = \boxed{\frac{1}{16}}
 \end{aligned}$$

$$\begin{aligned}
 3) \quad & (2^2)^{-3} = 2^{2 \cdot -3} \\
 & = 2^{-6} \\
 & = \frac{1}{2^6} = \boxed{\frac{1}{64}}
 \end{aligned}$$

$$\begin{aligned}
 4) \quad & (3^{-1})^4 \\
 & = 3^{-1 \cdot 4} \\
 & = 3^{-4} \\
 & = \frac{1}{3^4} = \boxed{\frac{1}{81}}
 \end{aligned}$$

$$\begin{aligned}
 5) \quad & \frac{(3^2)^{-2}}{(4^3)^{-1}} \\
 & = \frac{3^{2 \cdot -2}}{4^{3 \cdot -1}}
 \end{aligned}$$

Remember!  
Godown!

$$\begin{aligned}
 & = \frac{3^{-4}}{4^{-3}} \\
 & = \frac{4^3}{3^4}
 \end{aligned}$$

$$= \boxed{\frac{64}{81}} \leftarrow \text{Keep as a simplified improper fraction.}$$

$$\begin{aligned}
 6) \quad & \frac{4^{-1}}{(2^{-2})^4} \\
 & = \frac{4^{-1}}{2^{-2 \cdot 4}} \\
 & = \frac{4^{-1}}{2^{-8}}
 \end{aligned}$$

$$= \frac{2^8}{4^1}$$

$$= \frac{256}{4}$$

$$= \boxed{64}$$

Remember to  
simplify