8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.

Which expression equals $(4xy^2z^3)^2$?

A) $4x^2y^4z^6$ $4^2x^2y^4z^6$

B) $8x^2y^4z^6$

C) $16x^2y^4z^6$

D) $16x^3y^4z^5$

Which expression is equivalent to $6^5 \cdot 6^{-5} \cdot \left(\frac{4^9}{4^7}\right)^{-3}$?

A) $\frac{1}{4}$

B) $\frac{1}{4^6}$ $6^5 \cdot 6^{-5} = 6^0 = 1$

C) $\frac{6}{4^{20}}$ $\frac{4^{-27}}{4^{-21}} = \frac{4^{21}}{4^{27}}$

D) $\frac{6}{4^{34}}$ $\frac{1}{4^6}$

What is another way to express 4^{-2}?

A) $\frac{1}{16}$

B) $\frac{16}{4}$

C) $\frac{8}{1}$

D) $\frac{32}{2}$

Jordan drove a^3 miles per hour for a^5 hours. How far did Jordan drive?

A) a^2 miles

B) a^8 miles $a^3 a^5$

C) a^{12} miles

D) a^{15} miles

A warehouse stores goods in cube-shaped boxes, each with a volume of x^3 cubic feet.

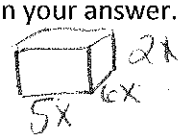
Part A

If the volume of a single box is 216 cubic centimeters, what is the value of x? Explain your answer.

$\sqrt[3]{216} = 6$ $V = 216$ $V = x^3$ so $x^3 = 216$ $x = \sqrt[3]{216} = 6$

Part B

In one room, the boxes are arranged together to form a rectangular solid measuring **2x** feet high, **5x** feet long, and **6x** feet wide. If each box has a volume of x^3 cubic feet, how many boxes are arranged together in this room? Explain your answer.



Total vol $5x \cdot 6x \cdot 2x = 60x^3$

$\frac{60x^3}{x^3}$ (total vol) / (vol of one) $= 60$ boxes

Part C

In a second room, boxes are arranged together in a straight line of length **3x**. What is the total volume of all the boxes in the second room in terms of x? Explain your answer.

3x

1x 1x 1x = 3 boxes

1box 1box 1box

vol 3 boxes $= 3 \cdot \frac{x^3}{1} = 3x^3$

one box

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Which term is equivalent to $\frac{2^{-3}}{2^2}$?

A. $\frac{1}{32}$

B. $\frac{1}{8}$

C. $\frac{1}{2}$

D. 2

$\frac{\frac{1}{2^3}}{2^2} \cdot \frac{1}{8} \cdot \frac{1}{4}$ $\frac{4}{1}$

Which expressions are equivalent to $\frac{3^{-8}}{3^{-4}}$? Select **all** that apply.

A. 3^{-12}

B. 3^{-4}

C. 3^2

D. $\frac{1}{3^2}$

E. $\frac{1}{3^4}$

F. $\frac{1}{3^{12}}$

$\frac{\frac{1}{3^8}}{\frac{1}{3^4}} \cdot \frac{3^4}{1} = \frac{3^4}{3^8} = \frac{1}{3^4}$

Which expression is equivalent to -16?

A. -8^2

B. -4^2

C. 4^{-2}

D. -16^0

Which expressions are equivalent to $\frac{1}{36}$? Select **all** that apply.

A. 6^{-2} $= \frac{1}{6^2} = \frac{1}{36}$

B. $6^{-4} \times 6^3$ $\frac{1}{6^4} \cdot 6^3 = \frac{6^3}{6^4} = \frac{1}{6}$

C. $6^{10} \times 6^{-8}$ $\frac{1}{6^{10}} \cdot \frac{1}{6^8} = \frac{6^2}{1}$

D. $6^8 \times 6^{-3}$

E. $6^{-10} \times 6^8$ $6^8 \cdot \frac{1}{6^{10}} = 6^{-2}$ $\frac{1}{6^{10}} \frac{6^8}{} = \frac{1}{6^2}$

Simplify $3^5 \cdot 3^3 \cdot 3^2$ using positive exponents.

A. 3^{10}

B. 27^{10}

C. 3^{30}

D. 27^{30}

$3^{5+3+2} = 3^{10}$

Simplify the expression: $(5y^4)^2$

A. $25y^6$

B. $25y^8$

C. $5y^6$

D. $5y^8$

$5^2 y^8$

Simplify the expression: $\frac{v^2}{v^6}$

A. $\frac{v^2}{v^4}$

B. $\frac{v}{v^{12}}$

C. $\frac{1}{v^4}$

D. v^4

$\frac{1}{v^4}$

Simplify $\frac{1}{2^{-3}}$.

A. 8

B. 6

C. $\frac{1}{6}$

D. $\frac{1}{8}$

$\frac{1}{\frac{1}{2^3}}$

Simplify the expression: $4x^{-2} \cdot 2x^3$

A. $8x$

B. $6x^{-5}$

C. $8x^{-6}$

D. $6x$

$4 \cdot \frac{1}{x^2} \quad 2x^3$

$\frac{8x^3}{x^2} = 8x$

Simplify: $\frac{x^{10}}{8x^5}$

A. $\frac{x^5}{8}$

B. $\frac{1}{8x^5}$

C. $8x^5$

D. $\frac{8}{x^5}$

$\frac{x^5}{8}$