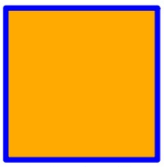
- Please pass out DHW Check Sheets
- DHW Check~

Box : Day 3 Exponents



Box : Day 3 Exponents

- When you finish your DHW Check, Please begin completing the following warm-up:

1) Solve for x. Determine the number of solution

$$\frac{1}{4}x - 13 = \frac{1}{4}(x + 13)$$

2) $3.\overline{2} \times \frac{1}{2}$

3) Write as an improper fraction. $2.1\overline{2}$

1) $\frac{1}{4}x - 13 = \frac{1}{4}(x+13)$

$\frac{1}{4}x - 13 = \frac{1}{4}x + \frac{13}{4}$

$\frac{1}{4}x - \frac{1}{4}x - 13 = \frac{1}{4}x - \frac{1}{4}x + \frac{13}{4}$

$-13 \neq \frac{13}{4}$ no solution

2) $3.\overline{2} \times \frac{1}{2}$

$3\frac{2}{9} \times \frac{1}{2}$

$\frac{29}{9} \cdot \frac{1}{2}$

$\frac{29}{18}$

3) $2.1\overline{2}$ ($\times 10$)

$= 21.\overline{2}$

$= 21\frac{2}{9}$

$= \frac{191}{9} \div 10$

$= \frac{191}{9} \cdot \frac{1}{10}$

$= \frac{191}{90}$

Day 3~ Exponents HW answers

Student

1. Which is equivalent to 5^{-1}?

   A. $\frac{1}{25}$

   B. $\frac{1}{5}$ $\quad \frac{5^{-1}}{5^1} = \frac{1}{5}$

   C. -5

   D. 4

2. Which expression is equivalent to $20^8 \div 20^2$?

   A. $4 \cdot 20$

   B. $6 \cdot 20$

   C. 20^4

   D. 20^6 $\quad \frac{20^8}{20^2} = 20^{8-2} = 20^6$

3. Which of the following represents $\frac{1}{16} \times \frac{1}{8}$ using exponential notation?

   A. $(2^4)(2^3) = 16 \cdot 8$

   B. $(2^4)(2^{-3}) \quad 16 \cdot \frac{1}{8}$

   C. $(2^{-4})(2^3) \quad \frac{1}{16} \cdot 8$

   D. $(2^{-4})(2^{-3}) \quad \frac{1}{16} \cdot \frac{1}{8}$

5. If $(-3)^5 \times (-3)^2 = (-3)^x$, what is the value of x?

   A. 3

   B. 7 $\quad (-3)^5 \times (-3)^2 = (-3)^{5+2} = (-3)^7$

   C. 10

   D. 25

6. Which of the following is equivalent to $\frac{5}{49}$?

   A. $5(7^2) = 5 \cdot 49$

   B. $\frac{1}{5(7^2)} = \frac{1}{5(49)}$

   C. $5 - 7^2 = 5 - 49$

   D. $5(7^{-2}) = \frac{5(7^{-2})}{7^2} = \frac{5}{49}$

7. Which of the following is equivalent to $10 \times 10^4 \times 10^3 \times 10^{-5}$?

   A. 10^2

   B. 10^3 $\quad 10^1 \cdot 10^4 \cdot 10^3 \cdot 10^{-5} = 10^{1+4+3+5} = 10^3$

   C. 10^7

   D. 10^{13}

8. Which expression is equivalent

D. $(2^{-4})(2^{-3})$ $\frac{1}{16} \cdot \frac{1}{8}$

4. What is the value of the expression $8^{-2} \times 8^{3}$?

A. 64

B. 8

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

D. $\frac{1}{48}$

$8^{-2} \cdot 8^{3} = 8^{-2+3}$

$= 8^{1}$

8. Which expression is equivalent to $\frac{(3^{2} \times 3^{-4})}{3^{2}}$?

A. -81

B. -12

C. $\frac{1}{12}$

D. $\frac{1}{81}$

$\frac{(3^{2} \cdot 3^{-4})}{3^{2}} = \frac{3^{2+-4}}{3^{2}} = \frac{3^{-2}}{3^{2}}$

$= 3^{-2-2}$

$= 3^{-4}$

* Cannot have a negative exponent!

$\frac{3^{-4}}{3^{4}} = \frac{1}{3^{4}}$

$= \frac{1}{81}$

9. Which expression is equivalent to $5^{2} \times 5^{6} \div 5^{-3}$?

A. 5^{4}

B. 5^{5}

C. 5^{9}

D. 5^{11}

rewrite

$\frac{5^{2} \cdot 5^{6}}{5^{-3}} = \frac{5^{2+6}}{5^{-3}} = \frac{5^{8}}{5^{-3}} = 5^{8--3} = 5^{8+3} = 5^{11}$

10. What is the value of the expression $\frac{2^{-6}}{2^4} \times 2^8$?

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

B. $\frac{1}{4}$

C. 4

D. 16

$\frac{2^{-6}}{2^4} \cdot 2^8$

$2^{-6-4} \cdot 2^8$

$2^{-10} \cdot 2^8$

$\frac{2^{-10} \cdot 2^8}{2^{10}} = 2^{8-10} = 2^{-2} = \frac{2^{-2}}{2^2} = \boxed{\frac{1}{4}}$

POWER OF A POWER

Exponents

Mrs. Ballard

Expanded Form and Exponential Form

Simplifying Powers

Evaluating Expressions

Zero Exponents

Negative Exponents

Multiplying Powers with the same base

Dividing Powers with the same base

Power of a Power

$(3^2)^4 = 3^2 \cdot 3^2 \cdot 3^2 \cdot 3^2 = 3^8$

Rule: $3^{2(4)} = 3^8$

Rule: ① Keep the base
② Multiply the exponents (distribute)
③ Remember: There cannot be a negative exponent in the final answer!

Ex 1) $(9^4)^5 = 9^{4(5)} = 9^{20}$

Ex 2) $(b^m)^n = b^{m(n)} = b^{mn}$

Ex 3) $(7^5)^{-3} = 7^{5(-3)} = 7^{-15} = \frac{1}{7^{15}}$

Ex 4) $(-2^2)^3 = -2^{2(3)} = -2^6 = -64$

Ex 5) $(2^{-7})^{-2} = 2^{-7(-2)} = 2^{14}$

Ex 6) $(3m^4)^3 = 3^{1(3)} m^{4(3)} = 3^3 m^{12} = 27m^{12}$

def: $3m^4 \cdot 3m^4 \cdot 3m^4 = 27m^{12}$

Power of a Power

Ex 7) $(4a^2b^3)^2 =$

$4^{1(2)} a^{2(2)} b^{3(2)}$

$4^2 a^4 b^6$

$16a^4b^6$