Definition of Exponents

Answer

Multiplication 👉 Exponent

- $6 \times 6 \times 6 = 6^3$
- $3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^6$
- $47 \times 47 \times 47 = 47^3$
- $99 \times 99 \times 99 \times 99 \times 99 = 99^5$
- $\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} = (\frac{1}{3})^4$
- $\frac{215}{216} \times \frac{215}{216} \times \frac{215}{216} = (\frac{215}{216})^3$

Exponent 👉 Multiplication

- $8^3 = 8 \times 8 \times 8 = 512$
- $12^2 = 12 \times 12 = 144$
- $(\frac{1}{5})^4 = (\frac{1}{5}) \times (\frac{1}{5}) \times (\frac{1}{5}) \times (\frac{1}{5}) = \frac{1}{625}$
- $20^5 = 20 \times 20 \times 20 \times 20 \times 20 = 3200000$

🤔 Challenge

- 2^{16} ___>___ 16^2

Converse to the same base 16

① $2^{16} = (2^4)^4 = 16^4$

② 16^4 ___>___ 16^2

③ 2^{16} ___>___ 16^2

Calculate the results separately.

① $2^{16} = 65536$

② $16^2 = 256$

③ 2^{16} ___>___ 16^2

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Operations of Exponents

Answer

✏️ Product and Quotient Rule

- ⭐ $4^2 \times 4^2 = 4^4 = 256$
- ⭐ $(\frac{1}{6})^2 \times (\frac{1}{6})^1 = (\frac{1}{6})^3 = \frac{1}{216}$
- ⭐ $(0.1)^3 \times (0.1)^2 = (0.1)^5 = 0.00001$
- ⭐ $25^{123} \div 25^{50} = 25^{73}$
- ⭐ $(\frac{1}{5})^{51} \div (\frac{1}{5})^{28} = (\frac{1}{5})^{23}$
- ⭐ $(\frac{11}{24})^{33} \div (\frac{11}{24})^{17} = (\frac{11}{24})^{16}$

✏️ Power Rule

- ⭐ $(3^{31})^7 = 3^{217}$
- ⭐ $(91^{25})^{11} = 91^{275}$
- ⭐ $((\frac{1}{3})^3)^2 = (\frac{1}{3})^6$
- ⭐ $(217^9)^6 = 217^{54}$

🤔 Challenge

- ⭐ $1^{2025} + 2025^0 + 2025^1$

  $= 1 + 1 + 2025$

  $= 2027$

$2025^0 = 2025^1 \div 2025^1 = 1$

打卡小结

通过这两天的打卡，小朋友已经能够理解Math6**指数与连乘的展开表达**以及重要的**运算律**，能够帮助更加顺利地过渡PreA的**有理数章节**学习💪

（明天打卡预告：代数表达式，坚持打卡得 coins）

Think Academy Online Campus

Definition of Algebraic Expressions

Answer

✏️ Write Algebraic Expressions

- 4 less than m <u>m - 4</u>
- The sum of z and 5 <u>z + 5</u>
- 10 minus 2y <u>10 - 2y</u>
- 7 multiplied by y, and add 4 <u>7y + 4</u>
- The sum of 5 times x and 9 times z <u>5x + 9z</u>
- The difference between 10 times y and 3 times z <u>10y - 3z</u>
- 6 greater than y <u>y + 6</u>
- 15 divided by y <u>$\frac{15}{y}$</u>
-

	$3+xy-z$	$a+b+5cd$
coefficient of the last term	-1	5
number of terms	3	3
number of different variables	3	4

✏️ Application of Algebraic Expressions

- At a museum, adult tickets cost $28 and child tickets cost $18.
  If *3* adults and *5* children visit the museum, the total cost is <u>174</u> dollars.
  If *m* adults and *n* children visit the museum, the total cost is <u>28m + 18n</u> dollars.
- At a concert, VIP tickets are $50, regular tickets are $35, and student tickets are $20.
  If *2* VIP, *4* regular guests, and *6* students attend, the total revenue is <u>360</u> dollars.
  If *x* VIP, *y* regular guests, and *z* students attend, the total revenue is <u>50x + 35y + 20z</u> dollars.

🤔 Challenge

- A clothing store sells T-shirts ($12 each), jeans ($25 each), jackets ($40 each), and hats ($8 each).
  Wholesaler A buys *x* jeans, *y* jackets, and *z* hats. The total price is <u>12x + 40y + 8z</u> dollars.
  Wholesaler B buys a total of 20 items, including T-shirts and jeans. If B buys *k* T-shirts, the total price is <u>12k + 25(20 - k)</u> dollars.
  Wholesaler C buys *p* jeans, *q* T-shirts, *r* jackets, and *s* hats. There is a 15% discount for hats. The total price is <u>25p + 12q + 40r + (1-15%) * 8s</u>
  = <u>25p + 12q + 40r + 6.8s</u> dollars.

Answer

✏️ Simplify Basic Algebraic Expressions

⭐ $125x + 87x = 212x$

⭐ $503m + 217 - 128m = 375m + 217$

⭐ $156a - 234b + 78a = 234a - 234b$

⭐ $3\frac{1}{4}y - 1\frac{3}{4}y = \frac{3}{2}y$

⭐ $\frac{7}{10}n + \frac{3}{5} - \frac{1}{2}n = \frac{1}{5}n + \frac{3}{5}$

⭐ $-\frac{3}{4}p + \frac{1}{2}q - \frac{1}{4}p = -p + \frac{1}{2}q$

✏️ Simplify Complex Algebraic Expressions

⭐ $24(3x + 15) - 95x = -23x + 360$

⭐ $45(12x + 23y) - 37(15x - 8y) = 1331y - 15x$

⭐ $428 - 156k - (237 + 89k) + 75k = -170k + 191$

⭐ $2\frac{1}{2}(8y + 7) - 1\frac{2}{3}y = \frac{55}{3}y + \frac{35}{2}$

⭐ $-\frac{1}{2}(6m - 4n) + \frac{3}{4}(8m + 12n) = 3m + 11n$

⭐ $\frac{3}{8}(16p + 24) - \frac{5}{6}(3p - \frac{12}{7}) = \frac{7}{2}p + \frac{73}{7}$

🤔 Challenge

⭐ $(x + 25)^2 - (x + 25)(x + 24)$
$= (x + 25)(x + 25) - (x + 25)(x + 24)$
$= (x + 25)((x + 25) - (x + 24))$
$= (x + 25)(x + 25 - x - 24)$
$= x + 25$

⭐ $(x - 1)^2 + (1 - x)(x + 1)$
$= (x - 1)(x - 1) - (x - 1)(x + 1)$
$= (x - 1)((x - 1) - (x + 1))$
$= (x - 1)(x - 1 - x - 1)$
$= -2(x - 1)$
$= -2x + 2$

打卡小结

通过这两天的打卡，小朋友已经能够理解Math6**代数表达式的定义**以及熟练掌握基本的**化简方法**，能够帮助更加顺利地过渡PreA的**代数表达、方程与不等式**学习💪

（下周打卡预告：方程，坚持打卡得 coins）