

2026 春季初一数学每日一题打卡 004

规定两数 a, b 之间的一种运算, 记作 (a, b) : 如果 $a^c = b$, 那么 $(a, b) = c$.

例如: 因为 $2^3 = 8$, 所以 $(2, 8) = 3$.

(1) 根据上述规定, 填空:

①若 $(-2, y) = 3$, 则 $y =$ _____ ;

② $(4, 16) =$ _____ ;

③若 $(x, 81) = 4$, 则 $x =$ _____ .

(2) 若 $(m^2, 7) = a$, $(m, 3) = b$, $(m^2, 63) = c$, 探究 a, b, c 之间的数量关系并说明理由.

(3) 下列结论一定正确的有 _____ (填序号).

① $4^{(2,8)} = 64$; ② $(a, 1) = 0 (a \neq 0)$; ③ $a^{(a,b)} = b$; ④ $(a, a) = 1$; ⑤若 $(a, b) = c$. 则 $(a^n, b^n) = c^n$; ⑥若 $(a, b) = c$. 则 $(3a, 3b) = c$.

试题解析

规定两数 a, b 之间的一种运算, 记作 (a, b) : 如果 $a^c = b$, 那么 $(a, b) = c$.

例如: 因为 $2^3 = 8$, 所以 $(2, 8) = 3$.

(1) 根据上述规定, 填空:

① 若 $(-2, y) = 3$, 则 $y = \underline{-8}$;

② $(4, 16) = \underline{2}$;

③ 若 $(x, 81) = 4$, 则 $x = \underline{\pm 3}$.

(2) 若 $(m^2, 7) = a$, $(m, 3) = b$, $(m^2, 63) = c$, 探究 a, b, c 之间的数量关系并说明理由.

(3) 下列结论一定正确的有 ①②③④ (填序号).

① $4^{(2,8)} = 64$; ② $(a, 1) = 0 (a \neq 0)$; ③ $a^{(a,b)} = b$; ④ $(a, a) = 1$; ⑤ 若 $(a, b) = c$. 则 $(a^n, b^n) = c^n$; ⑥ 若 $(a, b) = c$. 则 $(3a, 3b) = c$.

解: (1) ① \because 如果 $a^c = b$, 那么 $(a, b) = c$, $(-2, y) = 3$, $\therefore y = (-2)^3 = -8$, 故答案为: -8 ;

② $\because 4^2 = 16$, $\therefore (4, 16) = 2$, 故答案为: 2 ;

③ $(x, 81) = 4$, $\therefore x^4 = 81$, $\therefore x = \pm 3$, 故答案为: ± 3 ;

(2) $a + b = c$, 利用如下:

$$\because (m^2, 7) = a, (m, 3) = b, (m^2, 63) = c,$$

$$\therefore (m^2)^a = 7, m^b = 3, (m^2)^c = 63,$$

$$m^{2a} = 7, m^{2c} = 63,$$

$$\therefore m^{2a} \cdot m^{2b} = m^{2a} \cdot (m^b)^2 = 7 \times 3^2 = 7 \times 9 = 63$$

$$\therefore m^{2a} \cdot m^{2b} = m^{2c},$$

$$\therefore 2a + 2b = 2c,$$

$$\therefore a + b = c;$$

(3) ① $\because (2, 8) = 3$, $\therefore 4^{(2,8)} = 4^3 = 64$, 故结论正确;

② $\because a^0 = 1$, $\therefore (a, 1) = 0$, 故结论正确;

③ $\because (a, b) = c$, $\therefore a^c = b$, $\therefore a^{(a,b)} = b$, 故结论正确;

④ $\because (a, a) = 1$, $\therefore a^1 = a$, 故结论正确;

⑤ $\because (a, b) = c$, $\therefore a^c = b$, $\therefore (a^n)^c = b^n$, $\therefore (a^n, b^n) = c$,

故结论错误;

⑥ $\because (a, b) = c$, $\therefore a^c = b$, $\therefore (3a)^c = 3^c b$, $\therefore (3a, 3^c b) = c$,

故结论错误;

故答案为: ①②③④.