

(1) Choose the correct answer:

(a) $((-2^2)^3)^4 = (-2)^{2 \times 3 \times 4} = (-2)^{24}$

A. -2^{24}

B. $(-2)^9$

C. $(-2)^{24}$

D. -2^9

(b) $b^m \times 2b^n = 2 \times b^m \times b^n = 2 \times b^{m+n} = 2b^{m+n}$

A. $2b^{2mn}$

B. $2b^{mn}$

C. $2^{mn}b^{mn}$

D. $2b^{m+n}$

(c) The scientific notation for 12 003 is:

A. $1,2003 \times 10^3$

B. $1,23 \times 10^4$

C. $1,2003 \times 10^4$

D. 12×10^3

(2) Which of the following is equal to 1?

A. $4^0 \times 3^0 \times 2^0$

B. $4^0 + 3^0 + 2^0$

C. $4^0 - 3^0 + 2^0$

D. $4^0 \div 3^0 \div 2^0$

$= 1 \times 1 \times 1$

$= 1 + 1 + 1$

$= 1 - 1 + 1$

$= 1 \div 1 \div 1$

$= 1$

$= 3$

$= 1$

$= 1$

(3) Simplify the following by using exponential laws:

(a) $\left(\frac{a}{b}\right)^2 \times \left(\frac{b}{a}\right)^2$

(b) $\sqrt{5^{16m}2^{2mn}}$

$= \frac{a^2}{b^2} \times \frac{b^2}{a^2}$

$= \sqrt{5^{16m}} \times \sqrt{2^{2mn}}$

$= \frac{\cancel{a^2}}{\cancel{b^2}} \times \frac{\cancel{b^2}}{\cancel{a^2}}$

$= 5^{16m \div 2} \times 2^{2mn \div 2}$

$= 1$

$= 5^{8m} \times 2^{mn}$

$$(c) \quad (-2)^3 \times (-2)^4 \times (-1)^{18}$$

$$= (-2)^{3+4} \times (1)$$

$$= (-2)^7$$

$$= -128$$

$$(d) \quad -k^2(2k + 3p)^0$$

$$= -k^2 \times (1)$$

$$= -k^2$$

(4) Calculate the value of P if $3^{2010} + 3^{2011} + 3^{2012} = P \cdot 3^{2010}$
Show all steps.

$$\text{LHS} = 3^{2010} + 3^{2011} + 3^{2012}$$

$$= 3^{2010} + 3^1 \times 3^{2010} + 3^2 \times 3^{2010}$$

$$= 3^{2010}(1 + 3^1 + 3^2)$$

$$= 3^{2010}(1 + 3 + 9)$$

$$= 13 \cdot 3^{2010} = P \cdot 3^{2010} = \text{RHS}$$

$$\therefore P = 13$$

(5) Which of the following have the greater value?

$$\text{A. } 0,002$$

$$\text{C. } \sqrt{0,000004}$$

$$= 0,002$$

$$\text{B. } \frac{2}{10\,000}$$

$$= 0,0002$$

$$\text{D. } (0,02)^4$$

$$= 0,0004$$