

### **P3: Integer exponent and scientific notation**

1. The expression  $\frac{(0.00002)(6.9 \times 10^8)}{23}$  in scientific notation, is equal to

A)  $6 \times 10^2$

B)  $6 \times 10$

C)  $3 \times 10^2$

D)  $2 \times 10^2$

E)  $6 \times 10^{-2}$

2. If  $\frac{(12800)(2 \times 10^6)}{0.0064} = m \times 10^n$ , then  $m + n =$

A) 16

B) 13

C) 15

D) 14

E) 12

3. If  $M = -2^{-2} \cdot (-4)^0$  and  $N = -\frac{2}{5} \div 1.6$ , then the distance between  $M$  and  $N$  is equal to

A) 0

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

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

D)  $-\frac{84}{25}$

E)  $-\frac{1}{2}$

4. If  $x \neq 0, y \neq 0$ , and  $\frac{3(x^4y^{-1})^{-1}(-2x^{-2})^{-2}}{(2^{-1}y^{-2})^2} = kx^ay^b$ , then  $k + a + b =$

A) 8

B)  $\frac{16}{3}$

C) -43

D) 0

E)  $-\frac{3}{16}$

5. The decimal notation of the expression  $\frac{(1.6 \times 10^3)(5.1 \times 10^{-5})}{4.8 \times 10^2}$ , is

A) 0.00017

B) 0.000017

C) 0.0014

D) 140000

E) 0.0017

6. Let  $A = 0.0018$ ,  $B = 400000$ , and  $C = 0.0002$ . If  $\frac{AB}{C}$  is written in scientific notation, then  $\frac{AB}{C} =$

A)  $3.6 \times 10^6$

B)  $36 \times 10^5$

C) 3600000

D)  $1.8 \times 10^6$

E)  $18 \times 10^5$

7. If  $\frac{(3x^{-2}y^{-3})^{-2}}{27xy} = \frac{x^m y^n}{3^k}$ , then  $n + m + k =$

A) 13

B) 6

C) 3

D) 5

E) 11

8. The number  $(-2^{-2} + 3^{-1})^{-1}$  is equal to

A) 12

B) -12

C) 5

D) -5

E)  $\frac{12}{7}$

9. The number  $\frac{(6.9 \times 10^{29})(7.5 \times 10^{-14})}{0.023 \times 10^{16}}$  written in scientific notation is given by

- A)  $2.25 \times 10^2$
- B)  $22.25 \times 10^6$
- C)  $2.25 \times 10^{-2}$
- D)  $0.225 \times 10^4$
- E)  $2.25 \times 10^{-5}$

10. If  $\left(\frac{x^{3n}y^{2n}}{x^{-2n}y^{3n+1}}\right) = x^{An+B}y^{Cn+D}$ , then  $A + B + D =$

- A) 4
- B) 2
- C) -4
- D) -3
- E) 7

11. If  $2^{x-1} = y$ , then  $2^{3x-2} =$

A)  $2y^3$

B)  $4y^3$

C)  $y^3/8$

D)  $y^3/4$

E)  $y^3/2$

12. If  $p \neq 0$ , then which one of the following statements is FALSE

A)  $-3p^0 = -1$

B)  $3p^0 = 3$

C)  $(-3p)^0 = 1$

D)  $-(3p^0) = -3$

13. If  $p = 3$  and  $q = 2$ , then the value of  $\frac{p^{-1}+q^{-1}}{1-(pq)^{-1}} =$

A) 1

B)  $\frac{5}{7}$

C)  $\frac{25}{36}$

D)  $-\frac{1}{6}$

E) -1

14.  $\frac{(-2x^3)^2(xy)^{-3}}{(3x^{-5}y^2)^{-2}} =$

A)  $\frac{36y}{x^7}$

B)  $\frac{36x}{y^7}$

C)  $\frac{4y}{9x}$

D)  $-\frac{9y}{4x}$

E)  $36xy$

15. If  $\frac{(210000)(4 \times 10^{-12})}{0.000028} = m \times 10^n$  (in scientific notation), then  $m + n =$

A) -2

B) 1

16. Let  $A = 0.0000021$ ,  $B = 200000$ , and  $C = 8.4 \times 10^{-n}$ . If  $\frac{AB}{C} = 5 \times 10^3$ , then  $n =$

A) 5

17. If  $\frac{0.7 \times 10^{-5}}{(-1.4 \times 10^{-6})(-1000)} = A \times 10^B$  is written in scientific notation,

then  $A + B =$

A) 2

18. In scientific notation, the number  $\frac{(16000)(4.5 \times 10^{-4})}{0.048} =$

A)  $15 \times 10^2$

B)  $1.5 \times 10^3$

C)  $1.5 \times 10^2$

D)  $1.5 \times 10^{-2}$

E)  $15 \times 10^{-2}$

19.  $(1.3 \times 10^{-13}) + (12 \times 10^{-14}) =$

A)  $2.5 \times 10^{-13}$

B)  $25 \times 10^{-13}$

C)  $3.5 \times 10^{-13}$

D)  $13.3 \times 10^{-27}$

E)  $2.5 \times 10^{-27}$

20.  $(1.1)^2 - 2(1.1)(0.9) + (0.9)^2 =$

A)  $4 \times 10^{-2}$

B)  $2 \times 10^{-4}$

C)  $4 \times 10^{-1}$

D)  $2 \times 10^{-2}$

E)  $2 \times 10^{-1}$

21. If  $a = 2$  and  $b = -3$ , then  $(85)^{3a} \left( \frac{1}{a^{-2}} - \frac{3}{b^{-3}} \right)^{3b} =$

A)  $85^{-3}$

B) 0

C)  $-\frac{1}{77}$

D)  $-\frac{1}{85}$

E)  $85^{12}$

22. Let  $a = 93,000,000$  miles be the distance from the earth to the sun, and  $b = 1.86 \times 10^5$  miles per second be the speed of light. If  $c = \frac{a}{b}$  is the time, in seconds, for a light ray from the sun to reach the earth, then  $c =$

A)  $5 \times 10^2$

B)  $\frac{1}{2} \times 10^2$

C)  $\frac{1}{2} \times 10^2$

D)  $\frac{1}{2} \times 10^{-1}$

E)  $5 \times 10^{-1}$

23.

$$\frac{2}{2 - (2 - 2^{-1})^{-1}} =$$

A)  $-\frac{1}{2}$

B)  $\frac{3}{4}$

C)  $-4$

D)  $\frac{3}{2}$

E)  $\frac{1}{7}$

24.  $(x^2 - 1)^{-1} + (x^{-2} - 1)^{-1} =$

A) 1

B)  $\frac{2}{x^2-1}$

C)  $\frac{x^2-1}{x^2+1}$

D)  $\frac{x^2+1}{x^2-1}$

E) -1

25. If  $M = 0.00000003$  and  $N = 2700000000000$ , then  $\frac{\sqrt{MN}}{9 \times 10^0} =$

A)  $100\sqrt{10}$

B)  $\sqrt{10}$

C)  $100$

D)  $10\sqrt{10}$

E)  $10$