

SUBJECT: MATHEMATICS CLASS VII
TOPIC: EXPONENTS AND POWERS (WORKSHEET)

Q. Chose the correct option in Q 1 to 5

1. The value of $(-9)^2 \times (-4)^2$ is

- a. -1296 b. 97 c. 169 d. 1296

2. Simplify: $343^x \times 7^2$

- a. 7^{2x+3} b. 7^{3x+2} c. 7^{2x} d. 7^{3x-2}

3. The value of $2^3 \times 2^2 \times 5^5$ is

- a. 10^5 b. 10^4 c. 10^3 d. 10^2

4. The value of $(6^0 - 2^0) \times (6^0 + 2^0)$ is

- a. 2 b. 1 c. 3 d. 0

5. Expanded form of z^4 is _____.

- a. z b. $z \times z$ c. $z + z + z + z$ d. $z \times z \times z \times z$

6. 256 can be expressed in the exponential form as _____.

7. The number obtained from the expanded form $4 \times 10^3 + 2 \times 10^2 + 9 \times 10^1 + 3 \times 10^0$ is _____.

8. Express $\frac{256}{81}$ in the exponential form.

9. Express each of the following as product of powers of prime factors:

- a) 243×128 b) 512×121 c) 343×144 d) 3125×32

10. Find the value of $(4^{20} \div 8^5) \times 4^3$.

11. Find the product of cube of $(-3/5)$ and the fourth power of $(10/3)$.

12. By what number $(-5/4)^6$ should be divided to get $(-25/16)^8$?

13. What number should be multiplied by $(-8)^2$ so that the product would be equal to 32^3 ?

14. If $3^b \times 3^{b+1} = 3^{25}$, find the value of b.

15. If $\{(-4/3)^4 \times (3/2)^4\}^3 = p$, then find the value of $(p)^{1/6}$?

16. Simplify the following and write the answer in the exponential form

- | | |
|---|--|
| a) $\frac{13^3 \times 169^3 \times 243 \times 343}{169 \times 13^6 \times 729 \times 49}$ | c) $\frac{3^9 \times 9^6 \times 6^5 \times 27^2}{3125 \times 64^2 \times 729}$ |
| b) $\frac{7^3 \times 15^5 \times 2^6}{343 \times 6^6 \times 10^3}$ | d) $\frac{m^{x+y} \times m^{y+z} \times m^{z+x}}{m^x \times m^y \times m^z}$ |

17. If $\{(2/3)^2 \times (9/4)^3\}^{1/4} = m$, then find $81^{(2m/3)}$.

18. Simplify the following and write the answer in the standard form.

- a) $(3.5 \times 10^{12}) \div (5 \times 10^7)$ b) $(7.7 \times 10^5) \times (3 \times 10^8)$ c) $(2.25 \times 10^{10}) \div (15 \times 10^4)$

19. Write the standard form of the following.

- The distance between Earth and Pluto is 75146000000 m.
- One light year is equal to the distance of 9450000000000000 m.
- The average number of bacteria in human body is 3915000000000000.
- Height of the biggest mountain on Earth is 102000 m.
- Size of blue whale is 29520000000 nm.
- One mole consists of 60220000000000000000000 atoms.

20. Simplify the following and write the answer in an exponential form.

a) $(3^3 \times 3^7) \div 3^9$

b) $11^5 \times 121^2 \times 1331^2$

c) $23^2 \times 25^6 \times 115^3$

21. a) If $2^{2x-1} = 32$ and $2^{x+y} = 16$, then find $x^2 + y^2$.

b) If $9^{3p-2} \div 3 = 1$, then find p. (Hint: $3^0 = 1$)

22. Write the standard form of the followings:

a) 52, 00, 00, 000

b) 7, 25, 00, 000

c) 26, 25, 80, 000

d) 1, 29, 86, 50, 000

23. Replace * by an appropriate positive integer.

a) $(-3)^* = -27$

b) $(-2)^* = 16$.

c) $7^* = 16807$

d) $10^* = 1$

24. Find the value of 'a' if $[(-3)^3]^5 = (-3)^{3a}$.

25. If $2160 = 2^m \times 3^n \times 5^p$, find the value of m, n, p. hence evaluate $(-1)^m \times 2^n \times 10^p$.

26. Find the value of x that satisfies the given equations.

a) $6500000000 = 6.5 \times 10^x$

e) $2520000000 = x \times 10^8$

b) $34500000000000 = 3.45 \times 10^x$

f) $7890000 = 78.9 \times 10^x$

c) $28500000000 = x \times 10^{10}$

g) $22320000 = 2.232 \times 10^x$

d) $1125000000 = 1.12 \times 10^x$

27. a) Is $m^0 = 1$ true for all values of m ? Justify your answer.

b) Is $0^m = 0$ true for all values of m ? Justify your answer.

MAGIC SQUARE

Given below is a puzzle involving exponential laws in magic squares.

The product of each row, column and diagonal is the magic number.

2^9		2^{16}
2^{17}		
	2^{15}	

Magic number: 2^{30}

10^4		10^1
10^3	10^5	
	10^1	

Magic number: 10^{15}

3^{16}		3^2	3^{13}
3^5	3^{10}		3^8
		3^7	
3^4	3^{15}		3^1

Hint: Find the magic number yourself.