



SUBJECT : MATHEMATICS
CHAPTER NUMBER: 05
CHAPTER NAME : EXPONENTS

CHANGING YOUR TOMORROW

Website: www.odmegroup.org
Email: info@odmps.org

Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

Learning outcomes

Students will be able to express a given number in an exponential form.



PREVIOUS CONNECT

- Evaluate:
- $(3/4)^4$

81/256

EVALUATION QUESTIONS

5. Which is greater:

(iii) 4^3 or 3^4

(iv) 5^4 or 4^5

(iii) 4^3 or 3^4

It can be written as

$$4^3 = 4 \times 4 \times 4 = 64$$

$$3^4 = 3 \times 3 \times 3 \times 3 = 81$$

Hence, 81 is greater than 64 i.e. $3^4 > 4^3$.

(iv) 5^4 or 4^5

It can be written as

$$5^4 = 5 \times 5 \times 5 \times 5 = 625$$

$$4^5 = 4 \times 4 \times 4 \times 4 \times 4 = 1024$$

Hence, 1024 is greater than 625 i.e. $4^5 > 5^4$.

6. Express each of the following in exponential form:

(i) 512

(ii) 1250

(iii) 1458

6.Solution:

(i) 512

It can be written as

So we get

$$512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^9$$

(ii) 1250

It can be written as

So we get

$$1250 = 2 \times 5 \times 5 \times 5 \times 5 = 2 \times 5^4$$

(iii) 1458

It can be written as

So we get

$$1458 = 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 2 \times 3^6$$

7. If $a = 2$ and $b = 3$, find the value of:

(i) $(a + b)^2$

(ii) $(b - a)^3$

(iii) $(a \times b)^a$

(iv) $(a \times b)^b$

Solution:

(i) $(a + b)^2$

By substituting the values of a and b

$$= (2 + 3)^2$$

$$= 5^2$$

$$= 5 \times 5$$

$$= 25$$

(ii) $(b - a)^3$

By substituting the values of a and b

$$= (3 - 2)^3$$

$$= 1^3$$

$$= 1 \times 1 \times 1$$

$$= 1$$

(iii) $(a \times b)^a$

By substituting the values of a and b

$$= (2 \times 3)^2$$

$$= 6^2$$

$$= 6 \times 6$$

$$= 36$$

(iv) $(a \times b)^b$

By substituting the values of a and b

$$= (2 \times 3)^3$$

$$= 6^3$$

$$= 6 \times 6 \times 6$$

$$= 216$$

8. Express:

(i) 1024 as a power of 2.

(ii) 343 as a power of 7.

(iii) 729 as a power of 3.

Solution:

(i) 1024 as a power of 2.

It can be written as

So we get

$$1024 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^{10}$$

ii) 343 as a power of 7.

It can be written as

So we get

$$343 = 7 \times 7 \times 7 = 7^3$$

(iii) 729 as a power of 3.

It can be written as

So we get

$$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^6$$

9. If $27 \times 32 = 3^x \times 2^y$; find the values of x and y.

Solution:

It is given that

$$27 \times 32 = 3^x \times 2^y$$

So we get

$$27 = 3^x$$

Here

$$27 = 3 \times 3 \times 3 = 3^3 = 3^x$$

We get

$$x = 3$$

Similarly

$$32 = 2^y$$

Here

$$32 = 2 \times 2 \times 2 \times 2 \times 2 = 2^5 = 2^y$$

We get

$$y = 5$$

10. If $64 \times 625 = 2^a \times 5^b$; find: (i) the values of a and b. (ii) $2^b \times 5^a$.

Solution:

(i) the values of a and b

It is given that

$$64 \times 625 = 2^a \times 5^b$$

We know that

$$64 = 2^a$$

$$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

So we get

$$64 = 2^6$$

$$a = 6$$

Similarly

$$625 = 5^b$$

$$625 = 5 \times 5 \times 5 \times 5$$

So we get

$$625 = 5^4$$

$$b = 4$$

(ii) $2^b \times 5^a$

Substituting the values of a and b

$$= 2^4 \times 5^6$$

It can be written as

$$= 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$$

So we get

$$= 16 \times 15625$$

$$= 250000$$

HOMEWORK

- EX 5A

THANKING YOU
ODM EDUCATIONAL GROUP