

## EXERCISE 8.2

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1. Write each of the following products in exponential form:

- (i)  $a \times a \times a \times a \times \dots \times a$  15 times
- (ii)  $8 \times b \times b \times b \times a \times a \times a \times a$
- (iii)  $5 \times a \times a \times a \times b \times b \times c \times c \times c$
- (iv)  $7 \times a \times a \times a \dots \times a$  8 times  $\times b \times b \times b \times \dots \times b$  5 times
- (v)  $4 \times a \times a \times a \dots \times a$  5 times  $\times b \times b \times b \dots \times b$  12 times  $\times c \times c \dots \times c$  15 times

Solution:

- (i)  $a \times a \times a \times a \times \dots \times a$  15 times is written in exponential form as  $a^{15}$ .
- (ii)  $8 \times b \times b \times b \times a \times a \times a \times a$  is written in exponential form as  $8a^4b^3$ .
- (iii)  $5 \times a \times a \times a \times b \times b \times c \times c \times c$  is written in exponential form as  $5a^3b^2c^3$ .
- (iv)  $7 \times a \times a \times a \dots \times a$  8 times  $\times b \times b \times b \times \dots \times b$  5 times is written in exponential form as  $7a^8b^5$ .
- (v)  $4 \times a \times a \times a \dots \times a$  5 times  $\times b \times b \times b \dots \times b$  12 times  $\times c \times c \dots \times c$  15 times is written in exponential form as  $4a^5b^{12}c^{15}$ .

2. Write each of the following in the product form:

- (i)  $a^2 b^5$
- (ii)  $8x^3$
- (iii)  $7a^3b^4$
- (iv)  $15 a^9 b^8 c^6$
- (v)  $30x^4y^4z^5$
- (vi)  $43p^{10}q^5r^{15}$
- (vii)  $17p^{12}q^{20}$

Solution:

- (i)  $a^2 b^5$  is written in the product form as  $a \times a \times b \times b \times b \times b \times b$ .
- (ii)  $8x^3$  is written in the product form as  $8 \times x \times x \times x$ .
- (iii)  $7a^3b^4$  is written in the product form as  $7 \times a \times a \times a \times b \times b \times b \times b$ .
- (iv)  $15 a^9 b^8 c^6$  is written in the product form as  $15 \times a \times a \dots \times a$  9 times  $\times b \times b \times \dots \times b$  8 times  $\times c \times c \times \dots \times c$  6 times.
- (v)  $30x^4y^4z^5$  is written in the product form as  $30 \times x \times x \times x \times x \times y \times y \times y \times y \times z \times z \times z \times z \times z$ .
- (vi)  $43p^{10}q^5r^{15}$  is written in the product form as  $43 \times p \times p \dots \times p$  10 times  $\times q \times q \dots \times q$  5 times  $\times r \times r \times \dots \times r$  15 times.
- (vii)  $17p^{12}q^{20}$  is written in the product form as  $17 \times p \times p \dots \times p$  12 times  $\times q \times q \times \dots \times q$  20 times.

3. Write down each of the following in exponential form:

- (i)  $4a^3 \times 6ab^2 \times c^2$
- (ii)  $5xy \times 3x^2y \times 7y^2$
- (iii)  $a^3 \times 3ab^2 \times 2a^2b^2$

Solution:

(i)  $4a^3 \times 6ab^2 \times c^2$  is written in exponential form as  $24a^4b^2c^2$ .

(ii)  $5xy \times 3x^2y \times 7y^2$  is written in exponential form as  $105x^3y^4$ .

(iii)  $a^3 \times 3ab^2 \times 2a^2b^2$  is written in exponential form as  $6a^6b^4$ .

**4. The number of bacteria in a culture is  $x$  now. It becomes square of itself after one week. What will be its number after two weeks?**

**Solution:**

Number of bacteria in a culture =  $x$

It is given that

Number of bacteria becomes square of itself in one week =  $x^2$

So the number of bacteria after two weeks =  $(x^2)^2 = x^4$

Hence, the number of bacteria after two weeks is  $x^4$ .

**5. The area of a rectangle is given by the product of its length and breadth. The length of a rectangle is two-third of its breadth. Find its area if its breadth is  $x$  cm.**

**Solution:**

It is given that

Area of rectangle =  $l \times b$

Breadth =  $x$  cm

Length =  $(2/3)x$  cm

So the area of the rectangle =  $(2/3)x \times x = (2/3)x^2$  cm<sup>2</sup>

Hence, the area of rectangle is  $(2/3)x^2$  cm<sup>2</sup>.

**6. If there are  $x$  rows of chairs and each row contains  $x^2$  chairs. Determine the total number of chairs.**

**Solution:**

Number of rows of chairs =  $x$

Each row contains =  $x^2$  chairs

So the total number of chairs = number of rows of chairs  $\times$  chairs in each row

We get

Total number of chairs =  $x \times x^2 = x^3$

Hence, the total number of chairs is  $x^3$ .