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NCERT Class 9 Solutions: Number Systems (Chapter 1) Exercise 1.6

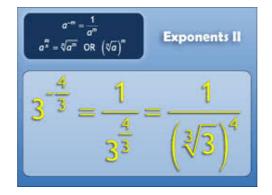
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Q-1 Find:

- 1. $64^{\frac{1}{2}}$
- 2. $32^{\frac{1}{5}}$
- 3. $125^{\frac{1}{3}}$

Solution:

$$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$$



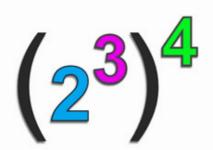
- 1. $64^{\frac{1}{2}} = (8^2)^{\frac{1}{2}}$
 - $=8^{2\times\frac{1}{2}}$
 - $= 8^{1}$
 - = 8
- 1. $32^{\frac{1}{5}} = (2^5)^{\frac{1}{5}}$
 - $=2^{5\times\frac{1}{5}}$
 - $= 2^1$
 - = 2
- 1. $125^{\frac{1}{3}} = (5^3)^{\frac{1}{3}}$
 - $=5^{3\times\frac{1}{3}}$
 - $=5^{1}$
 - = 5

Q-2 Find:

- 1. $9^{\frac{3}{2}}$
- 2. $32^{\frac{2}{5}}$
- 3. $16^{\frac{3}{4}}$
- 4. $125^{\frac{-1}{3}}$

Solution:

How to Expand Power of Power



The Power of "4" outside the brackets, tells us to multiply out what is contained in the brackets four times.

$$(2^3)^4 = 2^3 \times 2^3 \times 2^3 \times 2^3$$

Multiply four lots of what is in the brackets

Now apply the "Add Rule" for Multiplication

$$= 2^{3+3+3+3} = 2^{12} \checkmark$$

1.
$$9^{\frac{3}{2}} = (3^2)^{\frac{3}{2}}$$

$$=3^{2\times\frac{3}{2}}$$

$$= 3^3$$

1.
$$32^{\frac{2}{5}} = (2^5)^{\frac{2}{5}}$$

$$=2^{5\times\frac{2}{5}}$$

$$= 2^2$$

= 4

1.
$$16^{\frac{3}{4}} = (2^4)^{\frac{3}{4}}$$

$$= 2^{4 \times \frac{3}{4}}$$

$$= 2^3$$

1.
$$125^{\frac{-1}{3}} = \frac{1}{(125)^{\frac{1}{3}}}$$

$$= \frac{1}{(5^3)^{\frac{1}{3}}}$$

$$= \frac{1}{5}$$

Q-3 Find:

1.
$$2^{\frac{2}{3}} \times 2^{\frac{1}{5}}$$

2.
$$\left(\frac{1}{3^3}\right)^7$$

3.
$$\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}}$$

4.
$$7^{\frac{1}{2}} \times 8^{\frac{1}{2}}$$

Solution:

1.
$$2^{\frac{2}{3}} \times 2^{\frac{1}{5}} = 2^{\left(\frac{2}{3} + \frac{1}{5}\right)}$$

= $2^{\frac{10+3}{15}}$
= $2^{\frac{13}{15}}$

1.
$$\left(\frac{1}{3^3}\right)^7 = \frac{1}{3^{3\times7}}$$

$$= \frac{1}{3^{21}}$$

$$= 3^{-21}$$

1.
$$\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}} = 11^{\frac{1}{2} - \frac{1}{4}}$$
$$= 11^{\frac{2-1}{4}}$$
$$= 11^{\frac{1}{4}}$$

1.
$$7^{\frac{1}{2}} \times 8^{\frac{1}{2}} = (7 \times 8)^{\frac{1}{2}}$$

= $56^{\frac{1}{2}}$