



NCERT Solutions For Class 7 Maths Exponents and Powers Exercise
13.1

(iii) 112 (iv) 54

Ans:

$$(iv) 5_4 = 5 \times 5 \times 5 \times 5 = 625$$

Q2. Express the following in exponential form:

(v) $2 \times 2 \times a \times a$ (vi) $a \times a \times a \times c \times c \times c \times c \times d$

Ans:

(vi) $a x a x a x c x c x c x c x d = a_3 c_4 d$

Q3. Express the following numbers using exponential notation:

(iii) 729 (iv) 3125

Ans:

(iv) $3125 = 5 \times 5 \times 5 \times 5 \times 5 = 5^5$

Q4. Identify the greater number, wherever possible, in each of the following?

(iii) 28 or 8_2 (iv) 100_2 or 2_{100}

(v) 2_{10} or 10_2

Ans:

(i) $4_3 = 4 \times 4 \times 4 = 64$

$3_4 = 3 \times 3 \times 3 \times 3 = 81$

Therefore, $3_4 > 4_3$

(ii) $5_3 = 5 \times 5 \times 5 = 125$

$3_5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

Therefore, $3_5 > 5_3$

(iii) $2_8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$

$8_2 = 8 \times 8 = 64$

Therefore, $2_8 > 8_2$

(iv) 100_2 or 2_{100}

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

$2_{100} = 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024 \times 1024$

$100_2 = 100 \times 100 = 10000$

Therefore, $2_{100} > 100_2$

(v) 2_{10} and 10_2

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

$10_2 = 10 \times 10 = 100$

Therefore, $2_{10} > 10_2$

Q5. Express each of the following as product of powers of their prime factors:

(i) 648 (ii) 405

(iii) 540 (iv) 3,600

Ans:

(i) $648 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 = 2^3 \cdot 3^4$

(ii) $405 = 3 \times 3 \times 3 \times 3 \times 5 = 3^4 \cdot 5$

(iii) $540 = 2 \times 2 \times 3 \times 3 \times 3 \times 5 = 2^2 \cdot 3^3 \cdot 5$

(iv) $3600 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 = 2^4 \cdot 3^2 \cdot 5^2$

Q6. Simplify:

(i) $2 \times 10_3$ (ii) $7_2 \times 2_2$

(iii) $2_3 \times 5$ (iv) $3 \times 4_4$

(v) $0 \times 10_2$ (vi) $5_2 \times 3_3$

(vii) $2_4 \times 3_2$ (viii) $3_2 \times 10_4$

Ans:

(i) $2 \times 10_3 = 2 \times 10 \times 10 \times 10 = 2 \times 1000 = 2000$

(ii) $7_2 \times 2_2 = 7 \times 7 \times 2 \times 2 = 49 \times 4 = 196$

(iii) $2_3 \times 5 = 2 \times 2 \times 2 \times 5 = 8 \times 5 = 40$

(iv) $3 \times 4_4 = 3 \times 4 \times 4 \times 4 \times 4 = 3 \times 256 = 768$

(v) $0 \times 10_2 = 0 \times 10 \times 10 = 0$

(vi) $5_2 \times 3_3 = 5 \times 5 \times 3 \times 3 \times 3 = 25 \times 27 = 675$

(vii) $2_4 \times 3_2 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 16 \times 9 = 144$

(viii) $3_2 \times 10_4 = 3 \times 3 \times 10 \times 10 \times 10 \times 10 = 9 \times 10000 = 90000$

Q7. Simplify:

(i) $(-4)_3$ (ii) $(-3) \times (-2)_3$

(iii) $(-3)_2 \times (-5)_2$ (iv) $(-2)_3 \times (-10)_3$

Ans:

(i) $(-4)_3 = (-4) \times (-4) \times (-4) = -64$

(ii) $(-3) \times (-2)_3 = (-3) \times (-2) \times (-2) \times (-2) = 24$

(iii) $(-3)_2 \times (-5)_2 = (-3) \times (-3) \times (-5) \times (-5) = 9 \times 25 = 225$

(iv) $(-2)_3 \times (-10)_3 = (-2) \times (-2) \times (-2) \times (-10) \times (-10) \times (-10)$

$= (-8) \times (-1000) = 8000$

Q8. Compare the following numbers:

(i) 2.7×10^{12} ; 1.5×10^8

(ii) 4×10^{14} ; 3×10^{17}

Ans:

(i) 2.7×10^{12} ; 1.5×10^8

$$2.7 \times 10^{12} > 1.5 \times 10^8$$

(ii) 4×10^{14} ; 3×10^{17}

$$3 \times 10^{17} > 4 \times 10^{14}$$

*****END*****