



Indices and Roots **Answers**

1. Complete the table. The first one has been done for you.

2^4	$2 \times 2 \times 2 \times 2$	16
3^5	$3 \times 3 \times 3 \times 3 \times 3$	243
$(-2)^5$	$-2 \times -2 \times -2 \times -2 \times -2$	-32
3^7	$3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$	2187
4^6	$4 \times 4 \times 4 \times 4 \times 4 \times 4$	4096
6^4	$6 \times 6 \times 6 \times 6$	1296
10^5	$10 \times 10 \times 10 \times 10 \times 10$	100 000
$(-3)^3$	$-3 \times -3 \times -3$	-27
$(-5)^5$	$-5 \times -5 \times -5 \times -5 \times -5$	-3125

2. Write down the value for each of the following:

a. 3^2

$$= 3 \times 3$$

$$= 9$$

e. 2^7

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

$$= 128$$

b. 5^3

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

$$= 125$$

f. 3^{10}

$$= 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

$$= 59\,049$$

c. 2^5

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

$$= 32$$

g. $(-3)^5$

$$= -3 \times -3 \times -3 \times -3 \times -3$$

$$= -243$$

d. $(-2)^4$

$$= -2 \times -2 \times -2 \times -2$$

$$= 16$$

h. 6^5

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

$$= 7776$$

3. Write down the value for each of the following:

a. $\sqrt{144}$

± 12

b. $\sqrt[3]{343}$

7

c. $\sqrt[4]{16}$

± 2

d. $\sqrt[4]{625}$

± 5

e. $\sqrt[5]{-32}$

-2

f. $\sqrt[5]{100\,000}$

10

g. $\sqrt[4]{6561}$

± 9

h. $\sqrt[6]{64}$

± 2

i. $\sqrt[10]{1024}$

± 2

j. $\sqrt[5]{-243}$

-3

4. Fill in the gaps with the missing numbers.

a. $3^4 = 3 \times 3 \times 3 \times 3$

b. $(-4)^5 = -1024$

c. $10^6 = 1\,000\,000$

d. $(-2)^4 = -2 \times -2 \times -2 \times -2$

e. $\sqrt[6]{46\,656} = 6$

f. $2^{12} = 4096$

g. $(-5)^7 = -78\,125$

h. $\sqrt[7]{-2187} = -3$

Extension

Work out the value for each of the following:

a. $2^4 + 3^5$

$= 16 + 243$

$= 259$

b. $(-2)^5 \times 4^4$

$= -32 \times 256$

$= -8192$

c. $(-5)^6 + 10^7$

$= 15\,625 + 10\,000\,000$

$= 10\,015\,625$