Higher roots

Higher roots

1. Match the inverse operations.

$$\sqrt[5]{a} \qquad \sqrt[4]{a} \qquad \sqrt[7]{a} \qquad \sqrt[b]{a}$$

$$a^4 \qquad a^b \qquad a^5 \qquad a^7$$

2. True or false?

a) $\sqrt[3]{8} = 2$ 　　　 b) $\sqrt[4]{16} = 4$ 　　　 c) $\sqrt[5]{32} = 2$
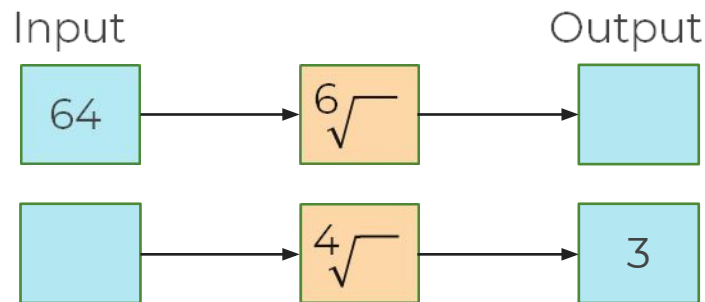
3. Evaluate.

a) $\sqrt[3]{1,000}$ 　　 b) $\sqrt[4]{10,000}$ 　　 c) $\sqrt[5]{100,000}$

4. Evaluate.

a) $\sqrt[3]{64}$ 　　　 b) $\sqrt[4]{256}$ 　　　 c) $\sqrt[5]{1024}$

5. Work out the missing values in the function machines.

Input		Output
64	$\sqrt[6]{}$	
	$\sqrt[4]{}$	3

2

Higher roots

6. Use a calculator to work out.

a) $\sqrt[5]{-32}$ b) $\sqrt[7]{-128}$ c) $\sqrt[6]{-64}$

7. Billy says,

> You can find the higher roots of any negative number!

Do you agree?

8. Use a calculator to work out.

a) $\sqrt[4]{0.0625}$ b) $\sqrt[5]{7.59375}$

9. a) Find the missing terms in this sequence.

?	$\sqrt[3]{a^3}$	$\sqrt[4]{a^4}$	$\sqrt[5]{a^5}$	?

b) Asia says,

> Every term is equal to 'a'.

Do you agree?

10. Evaluate without a calculator.

a) $\sqrt[4]{16} + \sqrt[5]{32}$
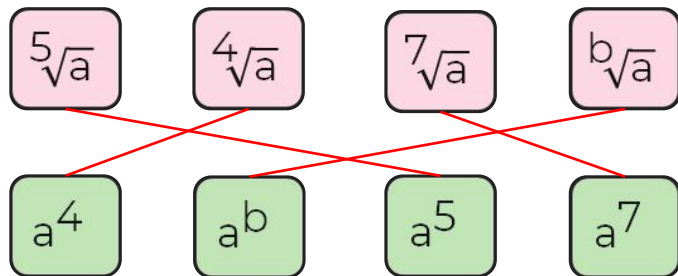
b) $\sqrt[4]{81} - \sqrt[6]{64}$

Answers

Higher roots

1. Match the inverse operations.

$\sqrt[5]{a}$ $\sqrt[4]{a}$ $\sqrt[7]{a}$ $\sqrt[b]{a}$

a^4 a^b a^5 a^7

2. True or false?

a) $\sqrt[3]{8} = 2$ b) $\sqrt[4]{16} = 4$ c) $\sqrt[5]{32} = 2$

   True   False   True
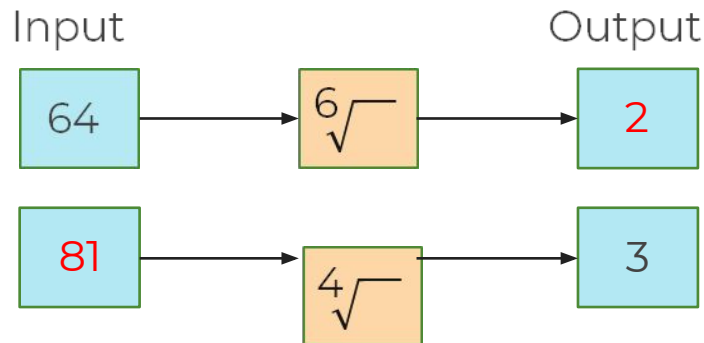
3. Evaluate.

a) $\sqrt[3]{1,000}$ b) $\sqrt[4]{10,000}$ c) $\sqrt[5]{100,000}$

   10   10   10

4. Evaluate.

a) $\sqrt[3]{64} = 4$ b) $\sqrt[4]{256} = 4$ c) $\sqrt[5]{1024} = 4$

5. Work out the missing values in the function machines.

Input   Output

64 → $\sqrt[6]{}$ → 2

81 → $\sqrt[4]{}$ → 3

Higher roots

6. Use a calculator to work out.

a) $\sqrt[5]{-32}$ b) $\sqrt[7]{-128}$ c) $\sqrt[6]{-64}$

   -2   -2   Error

7. Billy says,

> You can find the higher roots of any negative number!

Do you agree?
No. Only if the power is odd.

8. Use a calculator to work out.

a) $\sqrt[4]{0.0625}$ = 0.5   b) $\sqrt[5]{7.59375}$ = 1.5

9. a) Find the missing terms in this sequence.

$\sqrt{a^2}$ $\sqrt[3]{a^3}$ $\sqrt[4]{a^4}$ $\sqrt[5]{a^5}$ $\sqrt[6]{a^6}$

b) Asia says,

> Every term is equal to 'a'.

Do you agree? Yes.

10. Evaluate without a calculator.

a) $\sqrt[4]{16}$ + $\sqrt[5]{32}$ = 4

b) $\sqrt[4]{81}$ − $\sqrt[6]{64}$ = 1