

Calculations Using Indices (B)



Section A Work out the unknown value.

1) $8^a \times 8^a = 8^{-12}$

a =

2) $2^b \times 10 = 5$

b =

3) $\frac{1}{3} \times 4^t = \frac{1}{48}$

t =

4) $(-5^{-1})^x = 1$

x =

5) $\sqrt[4]{9} = 9^y$

y =

6) $\sqrt[3]{49} = 7^z$

z =

Section B Evaluate the following without a calculator.

| | |
|------------------------------------------|--|
| $144^{\frac{1}{2}}$ | |
| $277^{\frac{1}{3}}$ | |
| $(-1)^{\frac{1}{5}}$ | |
| $\left(\frac{1}{8}\right)^{\frac{1}{3}}$ | |

| | |
|---------------------------------------------|--|
| $4^{\frac{5}{2}}$ | |
| $64^{\frac{2}{3}}$ | |
| $(-1000)^{\frac{4}{3}}$ | |
| $\left(-\frac{8}{343}\right)^{\frac{2}{3}}$ | |

| | |
|-------------|--|
| 5^{-1} | |
| 3^{-2} | |
| $(-2)^{-4}$ | |

| | |
|---------------------------------|--|
| $\left(\frac{3}{4}\right)^{-2}$ | |
| 0.2^{-3} | |

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Section C

Draw a line matching the correct answer for each question.

1) $16^{\frac{1}{2}} \times 216^{\frac{1}{3}}$

2) $8^{-\frac{1}{3}} \times 100^{-\frac{3}{2}}$

3) $0.04^{-\frac{3}{2}}$

4) $\left(5\frac{1}{16}\right)^{\frac{3}{4}}$

A) 125

B) 24

C) $\frac{1}{1000}$

D) $\frac{8}{27}$

E) 0.0005

Extension

Express the following in the form 3^k

A) $\frac{1}{81}$

B) $\left(\frac{1}{27}\right)^{-5}$