



# Calculations Using Indices (B)

**Section A:** Work out the unknown value.

**ANSWERS**

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

$a = -6$

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

$b = -1$

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

$t = -2$

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

$x = 0$

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

$y = 1/4$

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

$z = 2/3$

**Section B:** Evaluate the following without a calculator.

$144^{\frac{1}{2}}$	<b>12</b>
$27^{\frac{1}{3}}$	<b>3</b>
$(-1)^{\frac{1}{5}}$	<b>-1</b>
$\left(\frac{1}{8}\right)^{\frac{1}{3}}$	<b>1/2</b>

$4^{\frac{5}{2}}$	<b>32</b>
$64^{\frac{2}{3}}$	<b>16</b>
$(-1000)^{\frac{4}{3}}$	<b>10000</b>
$\left(-\frac{8}{343}\right)^{\frac{2}{3}}$	<b>4/29</b>

$5^{-1}$	<b>1/5</b>
$3^{-2}$	<b>1/9</b>
$(-2)^{-4}$	<b>1/16</b>

$\left(\frac{3}{4}\right)^{-2}$	<b>16/9</b>
$0.2^{-3}$	<b>125</b>

**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) 1/1000**

**D) 8/27**

**E) 0.0005**

## Extension

Express the following in the form  $3^k$

A)  $\frac{1}{81} 3^{-4}$     B)  $\left(\frac{1}{27}\right)^{-5} 3^{15}$

How confidently can you solve calculations using fractional and negative indices?



Not confident



Fairly confident



Very confident

Your Score

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