Smallest Multiple That is a Perfect Cube

What is the smallest multiple by which 441 may be multiplied so that the product is a perfect cube?

3	441
3	147
7	49
7	7
	1

 $441 = 3 \times 3 \times 7 \times 7$

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We find that 7 and 3 occur only twice.

If we multiply 441 by 3 and 7 then,

9261 = 3 x 3 x 3 x 7 x 7 x 7

To make 441 a perfect cube it must be multiplied by 7 and 3 that is 21.

Cubes of Negative Integers

The cube of a negative integer is always negative.

$$(-1)^3 = (-1) \times (-1) \times (-1) = -1$$

 $(-2)^3 = (-2) \times (-2) \times (-2) = -8$

Cubes of Rational Numbers

$$\left(\frac{a}{b}\right)^3 = \frac{a \times a \times a}{b \times b \times b} = \frac{a^3}{b^3}$$
$$\left(\frac{3}{5}\right)^3 = \frac{3 \times 3 \times 3}{5 \times 5 \times 5} = \frac{33^3}{53^3}$$