ALGEBRA EXAMPLE 2

If x and y are positive whole numbers, what is the least value of y so that $48y = x^3$?

(A) 1 (B) 12 (C) 24 (D) 36

SOLUTION

$$48y = x^3$$

Write 48 in prime factors: $48 = 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3$

We require powers of 3: $2^4 \times 3 \times 2^2 \times 3^2 = 2^6 \times 3^3 = (2^2 \times 3)^3$

$2^2 \times 3^2 = 36$

This means that the correct answer is D.