Divisor Products

what's the product of all the divisors of n?

product of the divisors of 24:

$24 = 2^3 \cdot 3^1$

$1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 8 \cdot 12 \cdot 24 = 24^4$

$= n^{\frac{t(n)}{2}}$

$n = 60 = 2^2 \cdot 3^1 \cdot 5^1$

$t(n) = (2+1)(1+1)(1+1) = 12$

$60^{\frac{12}{2}} = 60^6$

Find the product of the divisors of 450 that are multiples of 3

$450 = 2^1 \cdot 3^2 \cdot 5^2$

$2^0 \quad 5^0$

$2^1 \quad 3^1 \quad 5^1$

$3^2 \quad 5^2$

$2 \cdot 2 \cdot 3 = 12$

$150 = 2^1 \cdot 3^1 \cdot 5^2$

$2^0 \quad 3^0 \quad 5^0$

$2^1 \quad 3^1 \quad 5^1$

5^2

$150^{\frac{12}{2}} \cdot 3^{12}$

$150^6 \cdot 3^{12}$

$50 = 2^1 \cdot 5^2$

50^3