

Counting in Number Theory



Learn how to solve this *type* of problems, not just this problem.



Tip: Always write down intermediate steps.

- (1) How many positive divisors does 20 have?

(Ref: 2481)

- (2) How many integer solutions does the equation $(x + 1)(y + 1) = 25$ have?

(Ref: 2483)

- (3) Find the number of different rectangles that satisfy the following conditions:

(a) its area is 2015

(b) the lengths of all its sides are integers

(Ref: 2482)

- (4) How many positive integers, not exceeding 2015, are relatively prime to 2015?

(Ref: 2506)

- (5) Let p be a prime number, compute $\phi(p)$.

(Ref: 2507)

- (6) Let p be a prime number and n be a positive integer. Show that $\phi(p^n) = p^n - p^{n-1}$.

(Ref: 2508)

- (7) Compute $\phi(5)$, $\phi(6)$, and $\phi(30)$. What relationship among these answers have you noticed?

- (8) Show that if a and b are relatively prime, then $\phi(a)\phi(b) = \phi(ab)$.

(Ref: 2509)

- (9) How many fraction numbers between 0 and 1 are there whose denominator is 1001 when written in its simplest form?

(Ref 2723)