

# Numbers as the Sum of Two Squares

(Numbers that are missing cannot be expressed as the sum of two squares.)

$2 = 1^2 + 1^2$	$148 = 2^2 + 12^2$	$298 = 3^2 + 17^2$
$5 = 1^2 + 2^2$	$149 = 7^2 + 10^2$	$305 = 4^2 + 17^2; 7^2 + 16^2$
$8 = 2^2 + 2^2$	$153 = 3^2 + 12^2$	$306 = 9^2 + 15^2$
$10 = 1^2 + 3^2$	$157 = 6^2 + 11^2$	$313 = 12^2 + 13^2$
$13 = 2^2 + 3^2$	$160 = 4^2 + 12^2$	$314 = 5^2 + 17^2$
$17 = 1^2 + 4^2$	$162 = 9^2 + 9^2$	$317 = 11^2 + 14^2$
$18 = 3^2 + 3^2$	$164 = 8^2 + 10^2$	$320 = 8^2 + 16^2$
$20 = 2^2 + 4^2$	$169 = 5^2 + 12^2$	$325 = 1^2 + 18^2; 6^2 + 17^2; 10^2 + 15^2$
$25 = 3^2 + 4^2$	$170 = 1^2 + 13^2; 7^2 + 11^2$	$328 = 2^2 + 18^2$
$26 = 1^2 + 5^2$	$173 = 2^2 + 13^2$	$333 = 3^2 + 18^2$
$29 = 2^2 + 5^2$	$178 = 3^2 + 13^2$	$337 = 9^2 + 16^2$
$32 = 4^2 + 4^2$	$180 = 6^2 + 12^2$	$338 = 7^2 + 17^2; 13^2 + 13^2$
$34 = 3^2 + 5^2$	$181 = 9^2 + 10^2$	$340 = 4^2 + 18^2; 12^2 + 14^2$
$37 = 1^2 + 6^2$	$185 = 4^2 + 13^2; 8^2 + 11^2$	$346 = 11^2 + 15^2$
$40 = 2^2 + 6^2$	$193 = 7^2 + 12^2$	$349 = 5^2 + 18^2$
$41 = 4^2 + 5^2$	$194 = 5^2 + 13^2$	$353 = 8^2 + 17^2$
$45 = 3^2 + 6^2$	$197 = 1^2 + 14^2$	$356 = 10^2 + 16^2$
$50 = 1^2 + 7^2; 5^2 + 5^2$	$200 = 2^2 + 14^2; 10^2 + 10^2$	$360 = 6^2 + 18^2$
$52 = 4^2 + 6^2$	$202 = 9^2 + 11^2$	$362 = 1^2 + 19^2$
$53 = 2^2 + 7^2$	$205 = 3^2 + 14^2; 6^2 + 13^2$	$365 = 2^2 + 19^2; 13^2 + 14^2$
$58 = 3^2 + 7^2$	$208 = 8^2 + 12^2$	$369 = 12^2 + 15^2$
$61 = 5^2 + 6^2$	$212 = 4^2 + 14^2$	$370 = 3^2 + 19^2; 9^2 + 17^2$
$65 = 1^2 + 8^2; 4^2 + 7^2$	$218 = 7^2 + 13^2$	$373 = 7^2 + 18^2$
$68 = 2^2 + 8^2$	$221 = 5^2 + 14^2; 10^2 + 11^2$	$377 = 4^2 + 19^2; 11^2 + 16^2$
$72 = 6^2 + 6^2$	$225 = 9^2 + 12^2$	$386 = 5^2 + 19^2$
$73 = 3^2 + 8^2$	$226 = 1^2 + 15^2$	$388 = 8^2 + 18^2$
$74 = 5^2 + 7^2$	$229 = 2^2 + 15^2$	$389 = 10^2 + 17^2$
$80 = 4^2 + 8^2$	$232 = 6^2 + 14^2$	$392 = 14^2 + 14^2$
$82 = 1^2 + 9^2$	$233 = 8^2 + 13^2$	$394 = 13^2 + 15^2$
$85 = 2^2 + 9^2; 6^2 + 7^2$	$234 = 3^2 + 15^2$	$397 = 6^2 + 19^2$
$89 = 5^2 + 8^2$	$241 = 4^2 + 15^2$	$400 = 12^2 + 16^2$
$90 = 3^2 + 9^2$	$242 = 11^2 + 11^2$	$401 = 1^2 + 20^2$
$97 = 4^2 + 9^2$	$244 = 10^2 + 12^2$	$404 = 2^2 + 20^2$
$98 = 7^2 + 7^2$	$245 = 7^2 + 14^2$	$405 = 9^2 + 18^2$
$100 = 6^2 + 8^2$	$250 = 5^2 + 15^2; 9^2 + 13^2$	$409 = 3^2 + 20^2$
$101 = 1^2 + 10^2$	$257 = 1^2 + 16^2$	$410 = 7^2 + 19^2; 11^2 + 17^2$
$104 = 2^2 + 10^2$	$260 = 2^2 + 16^2; 8^2 + 14^2$	$416 = 4^2 + 20^2$
$106 = 5^2 + 9^2$	$261 = 6^2 + 15^2$	$421 = 14^2 + 15^2$
$109 = 3^2 + 10^2$	$265 = 3^2 + 16^2; 11^2 + 12^2$	$424 = 10^2 + 18^2$
$113 = 7^2 + 8^2$	$269 = 10^2 + 13^2$	$425 = 5^2 + 20^2; 8^2 + 19^2; 13^2 + 16^2$
$116 = 4^2 + 10^2$	$272 = 4^2 + 16^2$	$433 = 12^2 + 17^2$
$117 = 6^2 + 9^2$	$274 = 7^2 + 15^2$	$436 = 6^2 + 20^2$
$122 = 1^2 + 11^2$	$277 = 9^2 + 14^2$	$442 = 1^2 + 21^2; 9^2 + 19^2$
$125 = 2^2 + 11^2; 5^2 + 10^2$	$281 = 5^2 + 16^2$	
$128 = 8^2 + 8^2$	$288 = 12^2 + 12^2$	
$130 = 3^2 + 11^2; 7^2 + 9^2$	$289 = 8^2 + 15^2$	
$136 = 6^2 + 10^2$	$290 = 1^2 + 17^2; 11^2 + 13^2$	
$137 = 4^2 + 11^2$	$292 = 6^2 + 16^2$	
$145 = 1^2 + 12^2; 8^2 + 9^2$	$293 = 2^2 + 17^2$	
$146 = 5^2 + 11^2$	$296 = 10^2 + 14^2$	

*The first number that can be expressed in 4 ways is...*

$$1105 = 4^2 + 33^2; 9^2 + 32^2; 12^2 + 31^2; 23^2 + 24^2$$