TRIANGLES ENTIERS
Table

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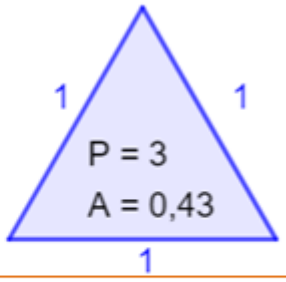
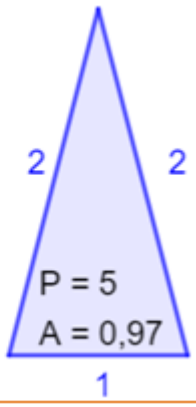
Triangles entiers

Un triangle entier est un triangle dont les longueurs des côtés sont des nombres entiers. Pour un périmètre P entier donné, les tripartitions (a, b, c) de P représentent tous les triangles entiers ayant ce périmètre, à condition que a + b < c avec a et b les deux plus petits côtés.

Sommaire

Les triangles entiers pour un périmètre de 3 à 11

P est le périmètre et A l'aire.

3	3 = 1 + 1 + 1 1 + 1 > 1	
4	4 = 1 + 1 + 2 1 + 1 = 2	**Aucun**
5	5 = 1 + 2 + 2 1 + 2 > 2 5 = 1 + 1 + 3 1 + 1 < 3	

6

$6 = 2 + 2 + 2$

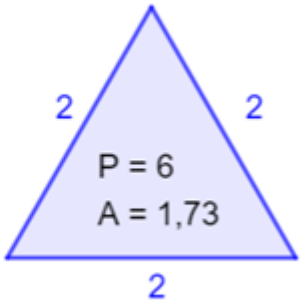
$2 + 2 > 2$

$6 = 1 + 2 + 3$

$1 + 2 = 3$

$6 = 1 + 1 + 4$

$1 + 1 < 4$



7

$7 = 2 + 2 + 3$

$2 + 2 > 3$

$7 = 1 + 3 + 3$

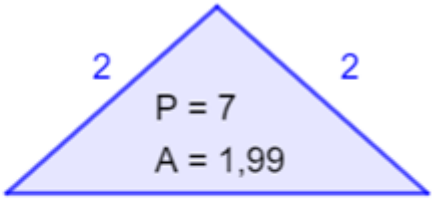
$1 + 3 > 3$

$7 = 1 + 2 + 4$

$1 + 2 < 4$

$7 = 1 + 1 + 5$

$1 + 1 < 5$



8

$8 = 2 + 3 + 3$

$2 + 3 > 3$

$8 = 2 + 2 + 4$

$2 + 2 = 4$

$8 = 1 + 3 + 4$

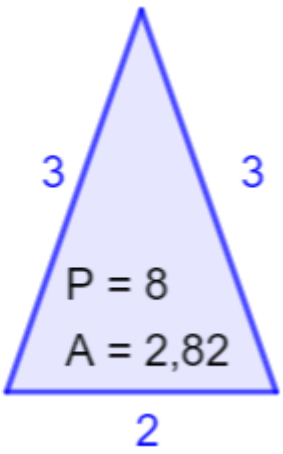
$1 + 3 = 4$

$8 = 1 + 2 + 5$

$1 + 2 < 5$

$8 = 1 + 1 + 6$

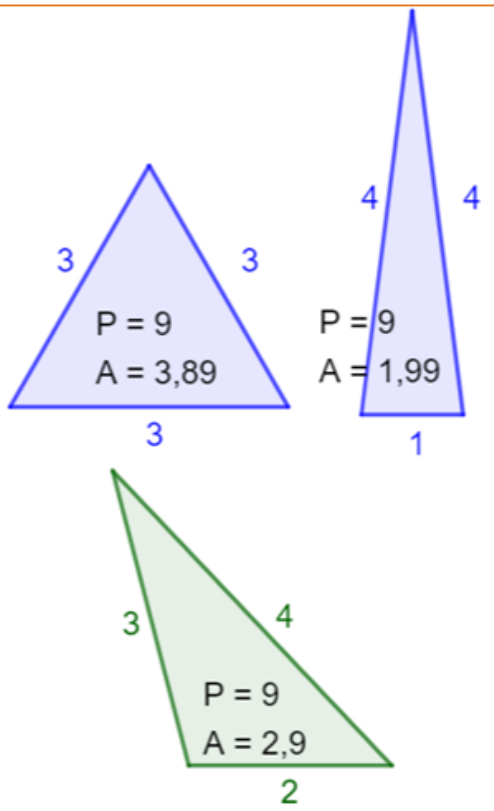
$1 + 1 < 6$



HAUT

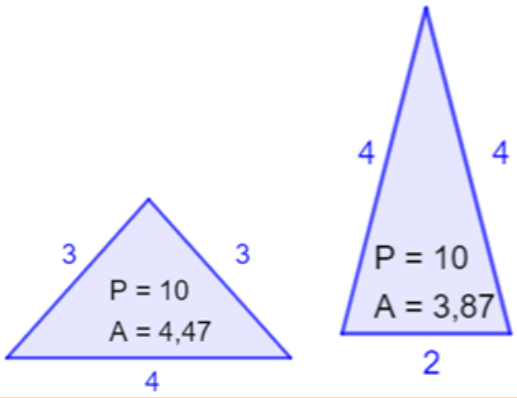
9

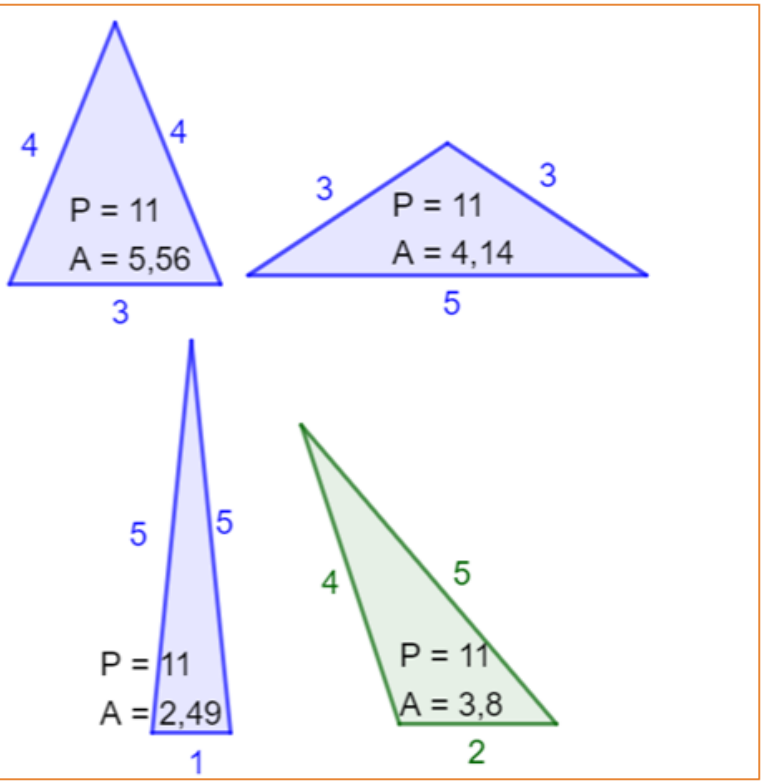
9 = 3 + 3 + 3
3 + 3 > 3
9 = 2 + 3 + 4
2 + 3 > 4
9 = 1 + 4 + 4
1 + 4 > 4
Autres



10

10 = 3 + 3 + 4
3 + 3 > 4
10 = 2 + 4 + 4
2 + 4 > 4
Autres



11	**11 = 3 + 4 + 4** 3 + 4 > 4 **11 = 3 + 3 + 5** 3 + 3 > 5 **11 = 2 + 4 + 5** 2 + 4 > 5 **11 = 1 + 5 + 5** 1 + 5 > 5 **Autres**	

HAUT

Quantité de triangles entiers en fonction du périmètre

Lecture: [9, 3] indique qu'il existe trois triangles entiers avec un périmètre 9.

[3, 1], [4, 0], [5, 1], [6, 1], [7, 2], [8, 1], [9, 3], [10, 2], [11, 4], [12, 3], [13, 5], [14, 4], [15, 7], [16, 5], [17, 8], [18, 7], [19, 10], [20, 8], [21, 12], [22, 10], [23, 14], [24, 12], [25, 16], [26, 14], [27, 19], [28, 16], [29, 21], [30, 19], [31, 24], [32, 21], [33, 27], [34, 24], [35, 30], [36, 27], [37, 33], [38, 30], [39, 37], [40, 33], [41, 40], [42, 37], [43, 44], [44, 40], [45, 48], [46, 44], [47, 52], [48, 48], [49, 56], [50, 52], …

Suite des quantités de triangles entiers en fonction des périmètres successifs

Lecture: 0, 0, 1 indique qu'il n'y a pas de triangle entier pour les périmètre 1 et 2, mais il y en a un pour le périmètre 3.

0, 0, 1, 0, 1, 1, 2, 1, 3, 2, 4, 3, 5, 4, 7, 5, 8, 7, 10, 8, 12, 10, 14, 12, 16, 14, 19, 16, 21, 19, 24, 21, 27, 24, 30, 27, 33, 30, 37, 33, 40, 37, 44, 40, 48, 44, 52, 48, 56, 52, 61, 56, 65, 61, 70, 65, 75, 70, 80, 75, 5, 80, 91, 85, 96, 91, 102, 96, 108, 102, 114, 108, 120, 114, 127, 120, 133, 127, 140, 133, 147, 140, 154, 147, 161, 154, 169, 161, 176, 169, 184, 176, 192, 184, 200, 192, 208, 200, 217, 208, 225, 217, 234, 225, 243, 234, 252, 243, 261, 252, 271, 261, 280, 271, 290, 280, 300, 290, 310, 300, 320, 310, 331, 320, 341, 331, 352, 341, 363, 352, 374, 363, 385, 374, 397, 385, 408, 397, 420, 408, 432, 420, 444, 432, 456, 444, 469, 456, 481, 469, 494, 481, 507, 494, 520, 507, 533, 520, 547, 533, 560, 547, 574, 560, 588, 574, 602, 588, 616, 602, 631, 616, 645, 631, 660, 645, 675, 660, 690, 675, 705, 690, 721, 705, 736, 721, 752, 736, 768, 752, 784, 768, 800, 784, 817, 800, 833, 817, 850, 833 …

OEIS A005044 - Alcuin's sequence: expansion of x^3/((1-x^2)*(1-x^3)*(1-x^4))

Table de triangles entiers en fonction du périmètre

Périmètre, Quantité, Côtés des triangles

3, 1, [1, 1, 1] – Un seul triangle de périmètre 3 et il est équilatéral avec des côtés unités.
4, 0 – Aucun triangle entier avec un périmètre égal à 4.
5, 1, [1, 2, 2]
6, 1, [2, 2, 2]
7, 2, [2, 2, 3], [1, 3, 3]
8, 1, [2, 3, 3]
9, 3, [3, 3, 3], [2, 3, 4], [1, 4, 4] – Le plus petit triangle entier non-isocèle.
10, 2, [3, 3, 4], [2, 4, 4]
11, 4, [3, 4, 4], [3, 3, 5], [2, 4, 5], [1, 5, 5]
12, 3, [4, 4, 4], [3, 4, 5], [2, 5, 5]
13, 5, [4, 4, 5], [3, 5, 5], [3, 4, 6], [2, 5, 6], [1, 6, 6]
14, 4, [4, 5, 5], [4, 4, 6], [3, 5, 6], [2, 6, 6]
15, 7, [5, 5, 5], [4, 5, 6], [3, 6, 6], [4, 4, 7], [3, 5, 7], [2, 6, 7], [1, 7, 7]
16, 5, [5, 5, 6], [4, 6, 6], [4, 5, 7], [3, 6, 7], [2, 7, 7]
17, 8, [5, 6, 6], [5, 5, 7], [4, 6, 7], [3, 7, 7], [4, 5, 8], [3, 6, 8], [2, 7, 8], [1, 8, 8]
18, 7, [6, 6, 6], [5, 6, 7], [4, 7, 7], [5, 5, 8], [4, 6, 8], [3, 7, 8], [2, 8, 8]
19, 10, [6, 6, 7], [5, 7, 7], [5, 6, 8], [4, 7, 8], [3, 8, 8], [5, 5, 9], [4, 6, 9], [3, 7, 9], [2, 8, 9], [1, 9, 9]
20, 8, [6, 7, 7], [6, 6, 8], [5, 7, 8], [4, 8, 8], [5, 6, 9], [4, 7, 9], [3, 8, 9], [2, 9, 9]
21, 12, [7, 7, 7], [6, 7, 8], [5, 8, 8], [6, 6, 9], [5, 7, 9], [4, 8, 9], [3, 9, 9], [5, 6, 10], [4, 7, 10], [3, 8, 10], [2, 9, 10], [1, 10, 10]
22, 10, [7, 7, 8], [6, 8, 8], [6, 7, 9], [5, 8, 9], [4, 9, 9], [6, 6, 10], [5, 7, 10], [4, 8, 10], [3, 9, 10], [2, 10, 10]
23, 14, [7, 8, 8], [7, 7, 9], [6, 8, 9], [5, 9, 9], [6, 7, 10], [5, 8, 10], [4, 9, 10], [3, 10, 10], [6, 6, 11], [5, 7, 11], [4, 8, 11], [3, 9, 11], [2, 10, 11], [1, 11, 11]
24, 12, [8, 8, 8], [7, 8, 9], [6, 9, 9], [7, 7, 10], [6, 8, 10], [5, 9, 10], [4, 10, 10], [6, 7, 11], [5, 8, 11], [4, 9, 11], [3, 10, 11], [2, 11, 11]
25, 16, [8, 8, 9], [7, 9, 9], [7, 8, 10], [6, 9, 10], [5, 10, 10], [7, 7, 11], [6, 8, 11], [5, 9, 11], [4, 10, 11], [3, 11, 11], [6, 7, 12], [5, 8, 12], [4, 9, 12], [3, 10, 12], [2, 11, 12], [1, 12, 12]
26, 14, [8, 9, 9], [8, 8, 10], [7, 9, 10], [6, 10, 10], [7, 8, 11], [6, 9, 11], [5, 10, 11], [4, 11, 11], [7, 7, 12], [6, 8, 12], [5, 9, 12], [4, 10, 12], [3, 11, 12], [2, 12, 12]
27, 19, [9, 9, 9], [8, 9, 10], [7, 10, 10], [8, 8, 11], [7, 9, 11], [6, 10, 11], [5, 11, 11], [7, 8, 12], [6, 9, 12], [5, 10, 12], [4, 11, 12], [3, 12, 12], [7, 7, 13], [6, 8, 13], [5, 9, 13], [4, 10, 13], [3, 11, 13], [2, 12, 13], [1, 13, 13]
28, 16, [9, 9, 10], [8, 10, 10], [8, 9, 11], [7, 10, 11], [6, 11, 11], [8, 8, 12], [7, 9, 12], [6, 10, 12], [5, 11, 12], [4, 12, 12], [7, 8, 13], [6, 9, 13], [5, 10, 13], [4, 11, 13], [3, 12, 13], [2, 13, 13]
29, 21, [9, 10, 10], [9, 9, 11], [8, 10, 11], [7, 11, 11], [8, 9, 12], [7, 10, 12], [6, 11, 12], [5, 12, 12], [8, 8, 13], [7, 9, 13], [6, 10, 13], [5, 11, 13], [4, 12, 13], [3, 13, 13], [7, 8, 14], [6, 9, 14], [5, 10, 14], [4, 11, 14], [3, 12, 14], [2, 13, 14], [1, 14, 14]
30, 19, [10, 10, 10], [9, 10, 11], [8, 11, 11], [9, 9, 12], [8, 10, 12], [7, 11, 12], [6, 12, 12], [8, 9, 13], [7, 10, 13], [6, 11, 13], [5, 12, 13], [4, 13, 13], [8, 8, 14], [7, 9, 14], [6, 10, 14], [5, 11, 14], [4, 12, 14], [3, 13, 14], [2, 14, 14]

31, 24, [10, 10, 11], [9, 11, 11], [9, 10, 12], [8, 11, 12], [7, 12, 12], [9, 9, 13], [8, 10, 13], [7, 11, 13], [6, 12, 13], [5, 13, 13], [8, 9, 14], [7, 10, 14], [6, 11, 14], [5, 12, 14], [4, 13, 14], [3, 14, 14], [8, 8, 15], [7, 9, 15], [6, 10, 15], [5, 11, 15], [4, 12, 15], [3, 13, 15], [2, 14, 15], [1, 15, 15]

32, 21, [10, 11, 11], [10, 10, 12], [9, 11, 12], [8, 12, 12], [9, 10, 13], [8, 11, 13], [7, 12, 13], [6, 13, 13], [9, 9, 14], [8, 10, 14], [7, 11, 14], [6, 12, 14], [5, 13, 14], [4, 14, 14], [8, 9, 15], [7, 10, 15], [6, 11, 15], [5, 12, 15], [4, 13, 15], [3, 14, 15], [2, 15, 15]

33, 27, [11, 11, 11], [10, 11, 12], [9, 12, 12], [10, 10, 13], [9, 11, 13], [8, 12, 13], [7, 13, 13], [9, 10, 14], [8, 11, 14], [7, 12, 14], [6, 13, 14], [5, 14, 14], [9, 9, 15], [8, 10, 15], [7, 11, 15], [6, 12, 15], [5, 13, 15], [4, 14, 15], [3, 15, 15], [8, 9, 16], [7, 10, 16], [6, 11, 16], [5, 12, 16], [4, 13, 16], [3, 14, 16], [2, 15, 16], [1, 16, 16]

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43, 44, [14, 14, 15], [13, 15, 15], [13, 14, 16], [12, 15, 16], [11, 16, 16], [13, 13, 17], [12, 14, 17], [11, 15, 17], [10, 16, 17], [9, 17, 17], [12, 13, 18], [11, 14, 18], [10, 15, 18], [9, 16, 18], [8, 17, 18], [7, 18, 18], [12, 12, 19], [11, 13, 19], [10, 14, 19], [9, 15, 19], [8, 16, 19], [7, 17, 19], [6, 18, 19], [5, 19, 19], [11, 12, 20], [10, 13, 20], [9, 14, 20], [8, 15, 20], [7, 16, 20], [6, 17, 20], [5, 18, 20], [4, 19, 20], [3, 20, 20], [11, 11, 21], [10, 12, 21], [9, 13, 21], [8, 14, 21], [7, 15, 21], [6, 16, 21], [5, 17, 21], [4, 18, 21], [3, 19, 21], [2, 20, 21], [1, 21, 21]

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