



**THIRD SPACE  
LEARNING**

# Triangular Numbers Worksheet

Algebra

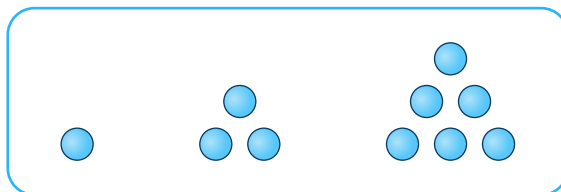
**Grades 9 to 12**

## Skill Questions

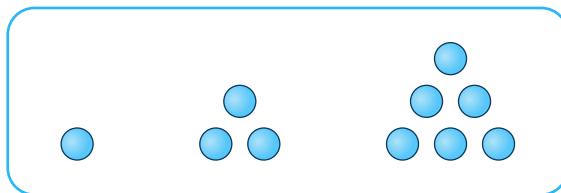
Name: .....

Date: .....

- 1 Draw the next triangle in the sequence.



- 2 If this pattern continues, how many dots will there be in the triangle that is in the 6th position?



Answer

- 3 What is the 10th triangular number?

Answer

- 4 What is the 15th triangular number?

Answer

## Triangular Numbers Worksheet | Grades 9 to 12

- 5 The first four triangular numbers are 1, 3, 6 and 10. What position in the sequence is the triangular number 66?

Answer

- 6 The first four triangular numbers are 1, 3, 6 and 10. What position in the sequence is the triangular number 36?

Answer

- 7 Using the formula,  $T_n = \frac{1}{2}n(n + 1)$ , find the 20th triangular number.

Answer

- 8 Using the formula,  $T_n = \frac{1}{2}n(n + 1)$ , what position is the triangular number 300 in?

Answer

- 9 Using the formula,  $T_n = \frac{1}{2}n(n + 1)$ , find the 40th triangular number.

Answer

## Triangular Numbers Worksheet | Grades 9 to 12

- 10 Using the formula,  $T_n = \frac{1}{2}n(n + 1)$ , what position is the triangular number 903 in?

Answer

---

Answer

---

## Applied Questions

- 11** A) Write the first six rows of Pascal's triangle.  
B) Identify the triangular numbers you see.

- 12** 171 is a triangular number. The calculation for finding the position of 684 is below. Identify the error and make the correction.

$$171 = \frac{1}{2}n(n + 1)$$

$$171 = \frac{1}{2}n^2 + \frac{1}{2}n$$

$$342 = n^2 + n$$

$$0 = n^2 + n - 342$$

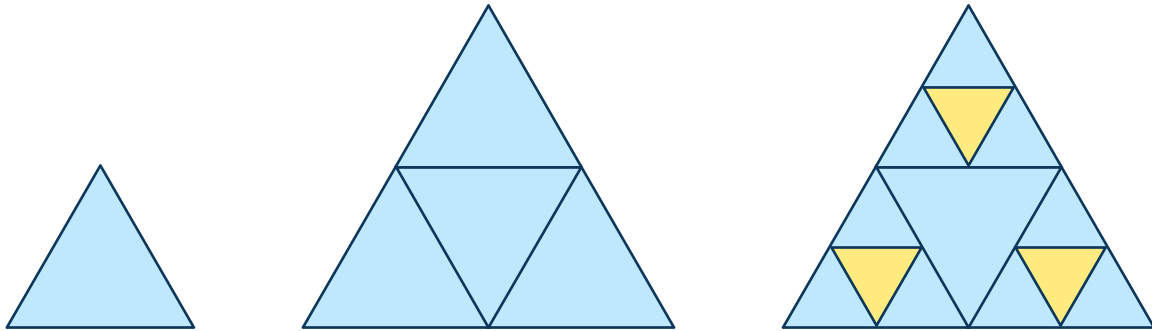
$$0 = (n + 18)(n - 19)$$

$$n = 19 \quad n = -18$$

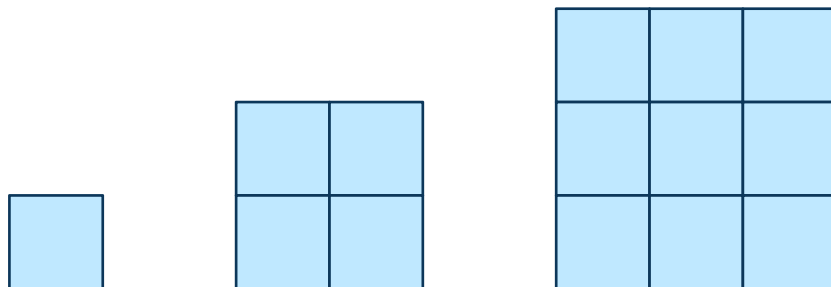
It is in the 19th position.

## Triangular Numbers Worksheet | Grades 9 to 12

- 13 Sketch the 4th figure in the sequence.



- 14 If this pattern continues, how many squares are there in the 9th position?

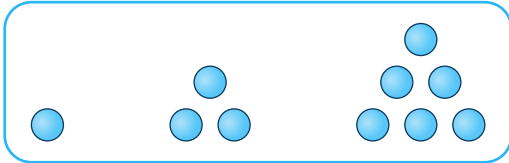
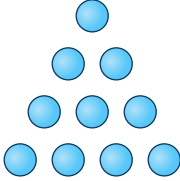
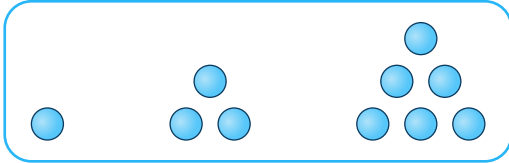


Answer

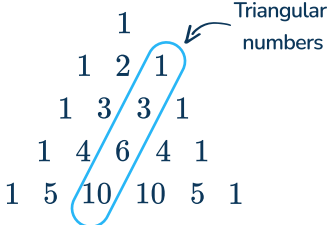
- 15 Identify a number that is a triangular number and also a perfect square number (other than 1).

Answer

# Answers

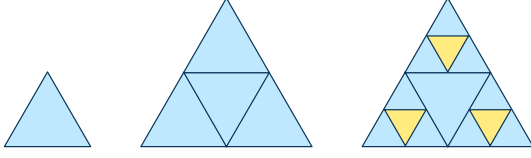
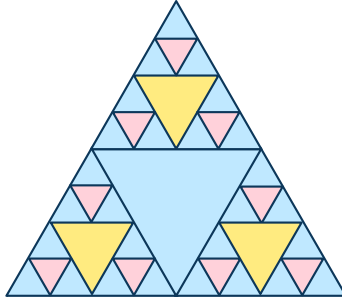
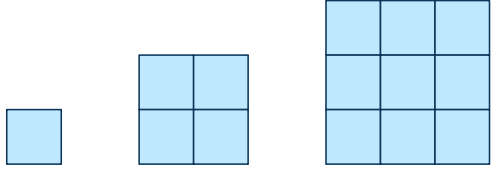
Question number	Question	Answers	Standard
1	<p>Draw the next triangle in the sequence.</p> 		HSF-IF.A.3
2	<p>If this pattern continues, how many dots will there be in the triangle that is in the 6th position?</p> 	21 dots	HSF-IF.A.3
3	What is the 10th triangular number?	55	HSF-IF.A.3
4	What is the 15th triangular number?	120	HSF-IF.A.3
5	The first four triangular numbers are 1, 3, 6 and 10. What position in the sequence is the triangular number 66?	11th position	HSF-IF.A.3
6	The first four triangular numbers are 1, 3, 6 and 10. What position in the sequence is the triangular number 36?	8th position	HSF-IF.A.3
7	Using the formula, $T_n = \frac{1}{2}n(n+1)$ , find the 20th triangular number.	210	HSF-IF.A.3

# Triangular Numbers Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
8	Using the formula, $T_n = \frac{1}{2}n(n+1)$ , what position is the triangular number 300 in?	24th position	HSF-IF.A.3
9	Using the formula, $T_n = \frac{1}{2}n(n+1)$ , find the 40th triangular number.	820	HSF-IF.A.3
10	Using the formula, $T_n = \frac{1}{2}n(n+1)$ , what position is the triangular number 903 in?	42nd position	HSF-IF.A.3
11	A) Write the first six rows of Pascal's triangle. B) Identify the triangular numbers you see.	 <p>1 1 2 1 1 3 3 1 1 4 6 4 1 1 5 10 10 5 1</p>	HSF-IF.A.3
12	<p>171 is a triangular number. The calculation for finding the position of 684 is in is below. Identify the error and make the correction.</p> $171 = \frac{1}{2}n(n+1)$ $171 = \frac{1}{2}n^2 + \frac{1}{2}n$ $342 = n^2 + n$ $0 = n^2 + n - 342$ $0 = (n+18)(n-19)$ $n = 19 \quad n = -18$ <p>It is in the 19th position.</p>	<p>The mistake is made in the factoring. It was factored incorrectly because</p> $(n+18)(n-19) \neq n^2 + n - 342$ <p>The correct factoring is:</p> $(n-18)(n+19) = n^2 + n - 342$ <p>So 171 is in the 18th position, not the 19th position.</p>	HSF-IF.A.3



# Triangular Numbers Worksheet | Grades 9 to 12 | Answers




Question number	Question	Answers	Standard
13	<p>Sketch the 4th figure in the sequence.</p> 		HSF-IF.A.3
14	<p>If this pattern continues, how many squares are there in the 9th position?</p> 	81 squares	HSF-IF.A.3
15	<p>Identify a number that is a triangular number and also a perfect square number (other than 1).</p>	36	HSF-IF.A.3

## Do you have a group of students who need a boost in math?

Each student could receive a personalized lesson every week from our specialist one-on-one math tutors.

- ✓ Differentiated instruction for each student
- ✓ Aligned to your state's standard
- ✓ Scaffolded learning to close gaps

## Speak to us

-  [thirdspacelearning.com/us/](https://thirdspacelearning.com/us/)
-  (929) 298-4593
-  [hello@thirdspacelearning.com](mailto:hello@thirdspacelearning.com)



**THIRD SPACE**  
LEARNING