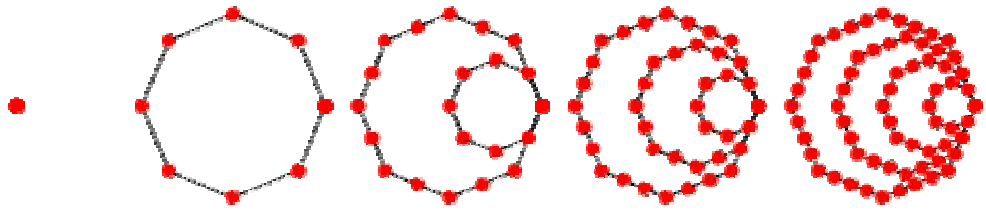
Octagonal Numbers:



A. An octagonal number is a number that creates a octagon. In other words: 1,8,21,40,etc.

B. The n^{th} octagonal number can be found by the following:

$$n(3n - 2)$$

C. In number sense, the question will only ask for the n^{th} octagonal number.

Ex [1] The 8^{th} octagonal number is _____.

a. Using the formula we get: 8 x 22 = 176.

b. The answer is 176.

Ex [2] The 11^{th} octagonal number is _____.

a. Using the formula we get: 11 x 31 = 343.

b. The answer is 343.

D. Here are some ways of manipulating octagonal numbers:

1. The difference of successive octagonal numbers is:

$$6n - 5, \text{ where n is the largest}$$

2. Adding successive octagonal numbers gives:

$$6n^2 - 10n + 5, \text{ where n is the largest}$$

NOTE: You might see #1 on a test, but I doubt you will ever see #2 on a test.