Grade 6 Equations/algebra practice

**Part A: Multiple Choice** Circle the letter of the best answer to each question.

1. Look at the pattern below. How many squares will there be in **figure 5**?



Figure 1 Figure 2 Figure 3 Figure 4

1. 10 B. 12 C. 14 D. 16

2. How many squares will be in **figure 6**?



Figure 1 2 3 4

1. 11 B. 12 C. 13 D. 15

3. What is the missing value?

A. 9

B. 10

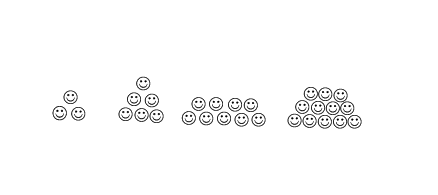
C. 11

D. 12

4. Match the following table of values to the correct equation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Term Number (N) | 1 | 2 | 3 | 4 |
| Pattern (P) | 4 | 7 | 10 | 13 |

1. 2n **+** 2= P B. 2n **+** 3= P C. 3n **+** 1= P D. 3n **+** 2= P



5. Which expression represents the picture below?

Term 1 2 3 4

**Note: “N” represents the term number**

1. 2n B. 2n **+** 1 C. 3n D. 3n **+** 1

|  |  |
| --- | --- |
| Number | Term Value |
| 1 | 4 |
| 2 | 6 |
| 3 | 8 |
| 4 |  |
| 5 | 12 |
| 6 | 14 |

6. Which table below matches the algebraic expression: 2T + 5

( a) ( b) ( c)

|  |  |
| --- | --- |
| Term  Number | Number of Dots |
| 1 | 0 |
| 2 | 3 |
| 3 | 6 |
| 4 | 9 |
| 5 | 12 |

|  |  |
| --- | --- |
| Term  Number | Number of Dots |
| 1 | 6 |
| 2 | 11 |
| 3 | 16 |
| 4 | 21 |
| 5 | 26 |

|  |  |
| --- | --- |
| Term  Number | Number of Dots |
| 1 | 7 |
| 2 | 9 |
| 3 | 11 |
| 4 | 13 |
| 5 | 15 |

1. What is the value of “”?
2. 12 b) 3 c) 27 d) 6
3. What is the value of “”?
4. 30 b) 270 c) 87 d) 93

1. What is the value of “”?

1. 5 b) 13 c) 10 d) 4
2. What is the value of “”?

1. 57 b) 45 c) 14 d) 9

**Part B: Constructed Response** -Answer all questions in the space provided. **Show all necessary work for full credit.**

1. Find the value of in the following one step equations

**You must show all your steps.**

1. c)
2. d)
3. **Solve** the following two step equations. **You must show all steps and show how you** **would check the accuracy of your answer**.

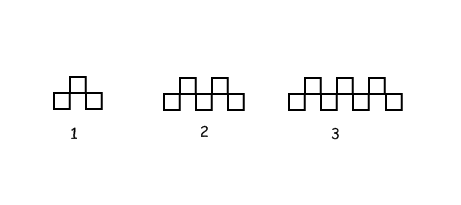
**Equation (2 marks each) Verifiy/Check answer (1 mark each)**

|  |  |
| --- | --- |
|  |  |
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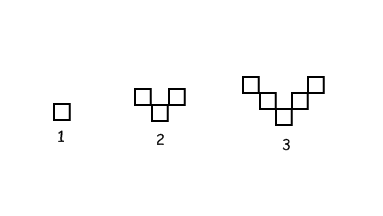
1. Match each pattern with the algebraic expression that represents the number of squares in the nth term.

**Note: “N” represents the term number**

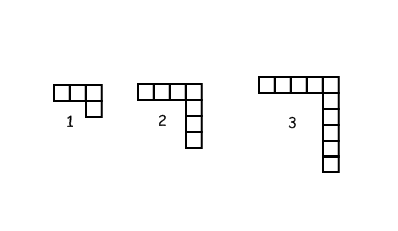
Pattern Expression



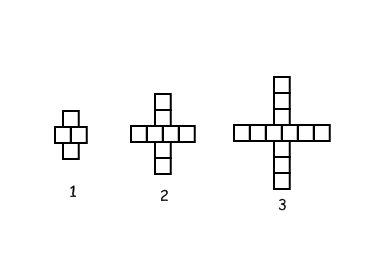
a) i) 4n



b) ii) 3n + 1



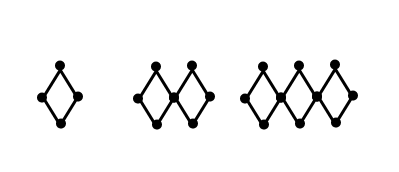
c) iii) 2n + 1



d) iv) 2n - 1

**Part C: Applications & Problem Solving** - Read the questions carefully and use the mark value to guide the depth of your responses. Answer each question in the space provided.

**D-1: Students will be able to continue and explain a pattern as a relation.**



1. Given the following pattern:

Term 1 Term 2 Term 3 Term 4 Term 5

a) Draw the 4th and 5th terms in the space above.

b) Complete the table of values.

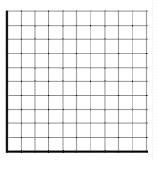
|  |  |
| --- | --- |
| Term  Number  (T) | Number of  Dots  (D) |
| 1 | 4 |
|  |  |
|  |  |
|  |  |
|  |  |

c) Describe the pattern in words.

d) Write an algebraic equation for the pattern.

e) Create a graph for the pattern from your table of values.

Please label all axes properly.



1. Predict the number of dots in the 15th term.

Explain or show how you know!

g) Which term will have 151 dots? Explain how you know!

2. From the relation: y = 2x + 1, create a table of values for 5 terms and graph it.

|  |  |
| --- | --- |
| X | Y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

