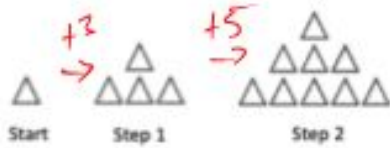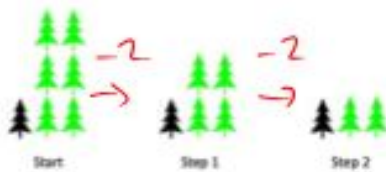1. For each pattern below, state whether it is linear or non-linear and **explain why**

    a. *Number of triangles*

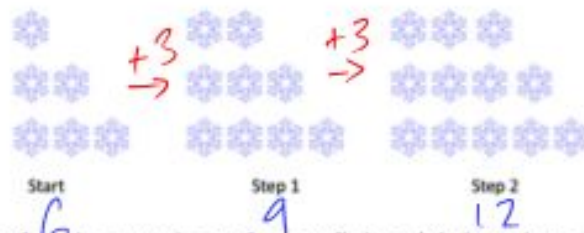

    non-linear

    No common difference

    b. *Number of trees*

    Linear,

    Common difference = -2

2. For the pattern below:

    6   9   12

    a. Write an equation for the number of snowflakes (*t*) that depends on the number of steps (*n*)

    $t = $ start $ + $ Common difference $ \cdot n$

    $t = 6 + 3n$

    b. Check your equation to show it is correct

    Step 2 $= 12$

    $t = 6 + 3(2) = 6 + 6 = 12$ ✓

    c. Determine the number of snowflakes in step 43

    $t = 6 + 3(43) = 6 + 129 = \underline{135}$

3. Draw a pattern with equation: t = 6 - 2n

Start = 6 (common diff = -2)

| Start | Step 1 | Step 2 |

4. The cost to rent a bus for a school field trip is a fixed price, plus a cost per student on the bus. A bus company advertises the following prices on their website:

Number of Students (n)	10	20	30
Cost (C)	85	115	145

+10 +10, +30 +30, 0, 55

a. What is the cost per student?

$+10 \text{ students} = +\$30$

$\Rightarrow +1 \text{ student} = +\$3$

b. Write an equation relating the cost (C) to the number of students on the bus (n) and check your equation to show it is correct

$Cost = start + \dfrac{Cost}{per\ student} \cdot number\ of\ students$

step 0

$$C = 55 + 3n$$

Check 30 students = $145

$C = 55 + 3 \cdot 30$

$C = 145 ✓$

c. How much would it cost to rent a bus for 44 students?

$C = 55 + 3(44) = \$187$