PATTERNS for y= mx+b

1. The pattern in this table continues. Which equation below relates the figure number n, to the perimeter of the figure P?

Figure Number, n	Perimeter, P
1	7
2	10
3	13
4	16

a) $P = 3n + 7$ b) $P = 7n + 3$

c) $P = 3n + 4$ d) $n = 3P + 7$

2. The pattern in each table below continues. **For each table:**
   i) Describe the pattern that relates v to t.
   ii) Write an equation that **relates v to t.**

   a)   b)

   iii) Verify your equation by substituting values from the table.

a)	Term Number, t	Term Value, v	b)	Term Number, t	Term Value, v
	1	8		1	34
	2	13		2	31
	3	18		3	28
	4	23		4	25

3. The pattern in this table continues. Write an equation that relates the term value to the term number.

Term Number, t	1	2	3	4	5
Term Value, w	5	8	11	14	17

4. The pattern in this table continues. Write an equation that relates the number of squares to the figure number.

Figure Number, f	1	2	3	4	5
Number of Squares, s	46	42	38	34	30

5. The pattern in the table continues.

n	1	2	3
P	7	11	15

       a) Describe the pattern that relates P to n.
       b) Write an equation that relates P to n.

6. The pattern in this table continues.

Term Number, n	1	2	3	4	5
Term Value, v	−5	−2	1	4	7

a) Write an equation that relates the term value, v, to the term number, n. Describe the pattern.

b) Determine the value of v when $n = 21$.

c) Which term number has a term value of 82?

PATTERN ANSWER KEY

1. The correct equation is $P = 3n + 4$.
2. **a) i)** The first term is 8 and as t increases by 1, v increases by 5.
   ii) $v = 5t + 3$
   b) i) The first term is 34 and as t increases by 1, v decreases by 3.
   ii) $v = 37 - 3t$

3.   ANS:
$w = 3t + 2$

4.   ANS:
$s = 50 - 4f$

5.   ANS:
a) As n increases by 1, P increases by 4.
b) The equation that relates P to n is $P = 3 + 4n$.

6.
a) $v = 3n - 8$.
    When n increases by 1, v increases by 3.
b)   Substitute $n = 21$ into the equation $v = 3n - 8$.
    $v = 3(21) - 8$
    $= 55$
c)   Substitute $v = 82$ into the equation $v = 3n - 8$.
    $82 = 3n - 8$
    $82 + 8 = 3n$
    $90 = 3n$
    $n = 30$
    Term 30 has a value of 82.