

BE-1A THURSDAY 2-1-07 $\rightarrow$

MENTAL MATH!

① $6\left(\frac{2}{7}\right)$

② $5\left(\frac{4}{3}\right)$

③ $-8\left(\frac{5}{2}\right)$

④ Solve for y , NOT MENTAL MATH!
 $-6x + 2y = 18$

①

SEQUENCE A SET OF NUMBERS IN A SPECIFIC ORDER.

ex) 2, 5, 8, ...



If you can get each term by adding or subtracting the same number to the term before it, it is called an **ARITHMETIC SEQUENCE**.

The number you add or subtract is called the **COMMON DIFFERENCE**.

ex) 2, 5, 8, ... is an ARITHMETIC SEQUENCE WITH A COMMON DIFFERENCE OF +3

②

If the sequence keeps getting bigger, the C.D. is $\oplus$.

If the sequence keeps getting smaller, the C.D. is $\ominus$.

Identify (yes or no) the ARITHMETIC SEQUENCES AND STATE (if it is ARITHMETIC) the C.D.

① $7, 15, 23, \dots$

② $6, -1, -8, \dots$

③ $\frac{1}{2}, \frac{1}{4}, 0, \dots$

④ $10, 15, 21, \dots$

⑤ $-6, -2, 2, \dots$



ELLIPSIS

③

FIND THE NEXT 3 terms OF
the ARITHMETIC SEQUENCE:

① 12, 18, 24, ...

② 74, 67, 60, 53, ...

EX 2 PG 234

↑ ↑ ↑
term 5 term 6 term 7

CAN YOU FIND THE 50th term
OF THE SEQUENCE IN ②? Hmmm
Let's try using algebra!

First, we need some good variable
names for all the terms in a
sequence. How about:

$f, s, t, \dots$

first, second, third,
term term term

ANY PROBLEMS?

(4)

How about

 $a_1, a_2, a_3, a_4, \dots, a_n$ Let $d =$ Common
Difference

If

 a_n is any termStarting with a_1 , how do you find a_2 ?

$$a_2 = a_1 + d$$

So to find a_2 , you added d to a_1 once
 to find a_3 , you added d to a_1 twice
 to find a_4 , you add d to a_1 three times

$$\therefore \text{to find } \boxed{a_n = a_1 + (n-1)d}$$

N^{th} term of an Arithmetic
Sequence Formula

Ex) Given 2, 5, 8, find a_6

$$\begin{array}{c} \uparrow \\ a_1 \end{array} \quad d = 3$$

$$\boxed{a_n = a_1 + (n-1)d}$$

USE WHAT
YOU KNOW

$$a_6 = 2 + (6-1)3$$

$$a_6 = 2 + (5)3 = 17$$

BACK TO our original problem:

⑤

Find the 50th term of:

74, 67, 60, 53, ...

$$a_1 = 74 \quad d = -7$$

$$a_n = a_1 + (n-1)d$$

$$a_{50} = 74 + (49)(-7)$$

$$a_{50} = 74 - 343$$

$$\boxed{a_{50} = -269}$$

$$\begin{array}{r} 2131 \\ 343 \\ -74 \\ \hline 269 \end{array}$$

6

Your turn:

FIND THE 14th term in the
ARITHMETIC SEQUENCE 9, 17, 25, 33, ...

UWYK

$$a_1 = 9 \quad d = 8$$

$$a_n = a_1 + (n-1)d$$

$$a_{14} = 9 + (14-1)8$$

$$a_{14} = 9 + (13)8$$

$$a_{14} = 9 + 104$$

$$a_{14} = 113$$

Summary:

ARITHMETIC SEQUENCE $\Rightarrow$ pattern of numbers THAT goes up or down by a common difference

$$UWYK \Rightarrow \boxed{Q_N = Q_1 + (N-1)d}$$

$\downarrow$
TO FIND ANY TERM "N"

Homework: Pg. 236 # 4 to 11