

**■ تمرين 01:**

200 150 125 120 83 75 72 :

$c = 7 \times 78 \quad b = 5 \times 78 \quad a = 78 :$

250 100 21

2500 1000 17

**■ تمرين 02:**

$n = 2^{10} \times 5^8 :$

$20n \quad n$

$n \quad m = 2^{12} \times 5^8 \times 7 \quad n \quad d = 2^8 \times 5^7$

**■ تمرين 03:**

$a \quad d \quad 11 \quad b \quad c \quad 7 \quad a \quad b$

$13 \quad c$

**■ تمرين 04:**

$\mathbb{N} \quad n$

(3):  $n - 4 \mid 3n + 24$     (2):  $n - 1 \mid n + 11$     (1):  $n \mid n + 8$

(E):  $x^2 - y^2 = 24 :$      $(x, y)$

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**25 9 5 4 3 2**

$N = 57364 :$

$N = 4 + 6 \times 10 + 3 \times 10^2 + 7 \times 10^4 + 5 \times 10^5 :$

$c_0 + c_1 \times 10 + c_2 \times 10^2 + \dots + c_r \times 10^r :$      $n$

$n = \overline{c_r \dots c_2 c_1 c_0} :$

**■ تعريف:**

$k \in \mathbb{N} \quad n = 2k \quad n$

$k \in \mathbb{N} \quad n = 2k + 1 \quad n$

**■ ملحوظات:**

$I \quad P$

$I = \{2k + 1 / k \in \mathbb{N}\} \quad P = \{2k / k \in \mathbb{N}\} :$

$I = \{1; 3; 5; 7; \dots; \rightarrow\} \quad P = \{0; 2; 4; 6; \dots; \rightarrow\} :$

$I \quad P$

$\mathbb{N}$

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**■ تعريف:**

$a$

$m = ka \quad \mathbb{N} \quad k \quad a \quad m$

$a \quad a\mathbb{N}$

$a = qd \quad \mathbb{N} \quad q \quad a \quad d$

$a \quad Div(a) \quad d \mid a$

$m \quad a \quad a \quad m :$

$a \in Div(m) \quad m \in a\mathbb{N}$

**■ ملحوظات:**

$\mathbb{N} \quad a \quad 0 = 0 \times a : \quad a \quad 0$

$\mathbb{N} \quad q \quad 0 \times q \neq a : \quad a \quad 0$

$\mathbb{N} \quad a \quad \{1; a\} \subset Div(a) \quad 1 \quad a$

■ ملحوظة:

.  $a \vee b = a$  :  $a$   $b$  -

■ تعريف:

$b$   $a$

.  $a \wedge b$

.  $a \wedge b = pge(Div(a) \cap Div(b))$  :

■ مثال:

$Div(45) = \{1; 3; 5; 9; 15; 45\}$  :  $45 = 1 \times 45 = 3 \times 15 = 5 \times 9$

$60 = 1 \times 60 = 2 \times 30 = 3 \times 20 = 4 \times 15 = 5 \times 12 = 6 \times 10$  :

$Div(60) = \{1; 2; 3; 4; 5; 6; 10; 12; 15; 20; 30; 60\}$  :

.  $45 \wedge 60 = 15$  :

■ خاصية:

.  $(a \vee b) \cdot (a \wedge b) = ab$  :  $b$   $a$

.  $a \vee b = ab$  :  $a \wedge b = 1$

$a \wedge b$

:  $a > b$   $b$   $a$

$r_1$   $b$   $a$

$r_2$   $r_1$   $r_2$   $r_1$   $b$

$a \wedge b$

■ مثال:

$45 \wedge 120$

$45 \wedge 120 = 15$ :		$q_1 = 2$	$q_2 = 1$	$q_3 = 2$
	$a = 120$	$b = 45$	$r_1 = 30$	$r_2 = 15$
	$r_1 = 30$	$r_2 = 15$	$r_3 = 0$	

■ مبرهنة:

$\{0; 2; 4; 6; 8\}$   $c_0$

$n$  -

.  $\{0; 5\}$   $c_0$

5  $n$

3 ( 9 ) 3  $n$  -

. ( 9 )

$c_1 c_0$  4  $n$  -

. 4  $n$

.  $c_1 c_0 \in \{00; 25; 50; 75\}$  : 25  $n$

■ تمرين 05:

. 6 3 - (1)

. 9 4 3 - (2)

9  $a = \overline{63x1}$  - (3)

3  $b = \overline{63x1}$   $x$  - (4)

9

. 4 3  $c = \overline{28x75y}$   $y$   $x$  - (5)

■ تعريف:

$b$   $a$

.  $a \vee b$

$b$   $a$

.  $a \vee b = ppe(a\mathbb{N}^* \cap b\mathbb{N}^*)$  :

■ مثال:

$15\mathbb{N}^* = \{15; 30; 45; 60; \dots \rightarrow\}$   $12\mathbb{N}^* = \{12; 24; 36; 48; 60; \dots \rightarrow\}$  :

.  $12 \vee 15 = 60$  :

7 5 3 2 :

100									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

\_\_\_\_\_ :

■ خاصية:

1

■ مثال:

:  $b = 3675 \quad a = 450$

:		2	3	3	5	5
$450 = 2 \times 3^2 \times 5^2$	$a = 450$	225	75	25	5	1
:		3	5	5	7	7
$3675 = 3 \times 5^2 \times 7^2$	$b = 3675$	1225	245	49	7	1

■ خاصية:

$b \wedge a \quad a \wedge b$

$b \vee a$

$b \vee a$

$b \wedge a$

$450 \wedge 3675 = 3 \times 5^2 = 3 \times 25 = 75$  :

$450 \vee 3675 = 2 \times 3^2 \times 5^2 \times 7^2 = 6 \times 3675 = 22050$

\_\_\_\_\_ - (1)

■ تعريف:

$n \quad 1 \quad n$

$Div(n) = \{1; n\}$  :

■ مثال:

29 23 19 17 13 11 7 5 3 2 :

2

■ تمرين 06:

:  $A_n \quad \mathbb{N} \quad n$

(3):  $A_n = n^4 + 4$  (2):  $A_n = n^2 - 8n + 15$  (1):  $A_n = n^2 + 4n + 3$

(crible d'ératosthène) : \_\_\_\_\_ - (2)

■ خاصية:

$a \geq 2$

$a \quad p^2 \leq a : \quad p$

$a$

■ مثال:

$b = 511 \quad a = 487$

13 11 7 5 3 2 :  $a = 487$

19 17

487 ( ) 487

$511 = 7 \times 73 : \quad b = 511$

■ غريال إراطوستين:

$10 \times 10$

$N = 100$

$N$

100 1

( ) 1

( 7 5 3 2 ) 7 5 3 2