الاسم:	مسابقة في مادة الرياضيات	عدد المسائل: خمس
الرقم:	المدة: ساعتان	

إرشادات عامة: - يسمح باستعمال آلة حاسبة غير قابلة للبرمجة أو اختزان المعلومات أو رسم البيانات.

- يستطيع المرشح الإجابة بالترتيب الذي يناسبه دون الالتزام بترتيب المسائل الواردة في المسابقة.

مسابقة في مادة الرياضيات

المدة: ساعتان

(انكليزي)

الاسم:.................................

الرقم:.................................

I – (5 points)

(Show all the steps of calculation)

1) **Given** $A = \sqrt{18} - \sqrt{8} + \sqrt{50}$.

   Show that $A = 6\sqrt{2}$.

2) **Given** $B = \dfrac{1}{\sqrt{2}+1}$.

   Show that $B = \sqrt{2} - 1$.

3) **Given** $C = \left(\sqrt{2}+1\right)^2 + 1$.

   Show that $C = 2\sqrt{2} + 4$.

4) show that $B \times A \times C = 24$.

II – (6 points)

1) Given $P(x) = (2x+1)^2 - (2x^2 + 9x + 4)$

  a. <u>Verify that</u> $(2x+1)(x+4) = 2x^2 + 9x + 4$.

  b. <u>Show that</u> $P(x) = (2x+1)(x-3)$.

  c.<u>Solve the equation</u> $(2x+1)(x-3) = 0$.

2) Let $H(x) = \dfrac{(2x+1)(x-3)}{4x^2 - 1}$.

  a. <u>Verify that</u> $4x^2 - 1 = (2x-1)(2x+1)$

  b. For what values of x, is $H(x)$ defined?

  c. <u>Show that</u> $H(x) = \dfrac{x-3}{2x-1}$

3)Solve $H(x) = \dfrac{2}{5}$

III – (5 points)

1) <u>Solve</u> the following system: $\begin{cases} x + y = 16 \\ 2x + 3y = 38 \end{cases}$

2) The following table represents the distribution of electronic games in a shop according to their prices:

Price of an electronic game (in LL)	3 000	4 000	5 000	6 000
Number of electronic games	9	m	15	n
Total price	3 000 × 9	4 000× m		

a. <u>Complete</u> the table.

b. The total price of all electronic games in this shop is 178 000 LL.

- <u>Show that</u> this information is modeled by the following equation: $2m + 3n = 38$.

c. Knowing that the total number of electronic games in this shop is 40.

<u>Show that</u> this information is modeled by the following equation:

$m + n = 16$.

d. Using the two equations found in **b** and **c**:

e. <u>Calculate</u> **m** and **n**.

IV- (2 points)

Given the proportional table below:

a	4	c
4	b	10

a) Calculate $a \times b$

b) Given $b = 8,$ calculate **a** and23 **c**

V- (2 points)

Given $X = 2$ and $Y = 4$

a) Calculate $X^2 + Y^2$

b) Deduce $(X + Y)^2$