دورة سنة ٢٠٠٦ الأستثنائية	امتحانات شهادة الثانوية العامة فرع الآداب والأ نسانيات	وزارة التربية والتعليم العالي المديرية العامة للتربية دائرة الامتحانات

الاسم: الرقم:	مسابقة في مادة الرياضيات المدة: ساعة واحدة	عدد المسائل: ثلاث

ملاحظة: :يسمح باستعمال آلة حاسبة غير قابلة للبرمجة او اختزان المعلومات او رسم البيانات.
يستطيع المرشح الإجابة بالترتيب الذي يناسبه (دون الالتزام بترتيب المسائل الوارد في المسابقة)

I-(4points)
Samir wants to buy a coat and a jacket; the initial price of these two pieces is 650 000 LL.
The salesman offers a discount of 15 % on the price of the coat and 20 % on the price
of the jacket, and so the price of these two pieces becomes 540 000 LL.

1) Determine the initial price of each of these pieces.

2) Determine the price of each piece after the discount.

II-(6 points)
The monthly salaries, in thousands LL, of the 60 employees of a company are distributed
as shown in the following table:

Monthly salaries (in thousands LL)	[400 ; 600[	[600 ; 800[	[800 ; 1000[	[1000 ; 1200[	[1200 ; 1400]
Frequency	8	16	20	10	6

1) Calculate the average salary of these 60 employees.

2) Determine the modal class. Find the mode and interpret the answer obtained.

3) An employee of this company is chosen randomly.
   a- What is the probability that his salary is less than one million LL ?
   b- Knowing that the salary of this employee is more than or equal to one million LL,
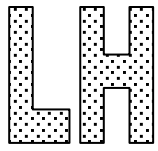   what is the probability that it is less than 1 200 000 LL ?

III-(10 points)

The curve (C) shown below is the representative curve, in an orthonormal system, of a function f that is defined on $]-\infty \; ; 2[\; \cup \;]2 \; ; +\infty[$.

The lines (d) and (D) are asymptotes of (C).
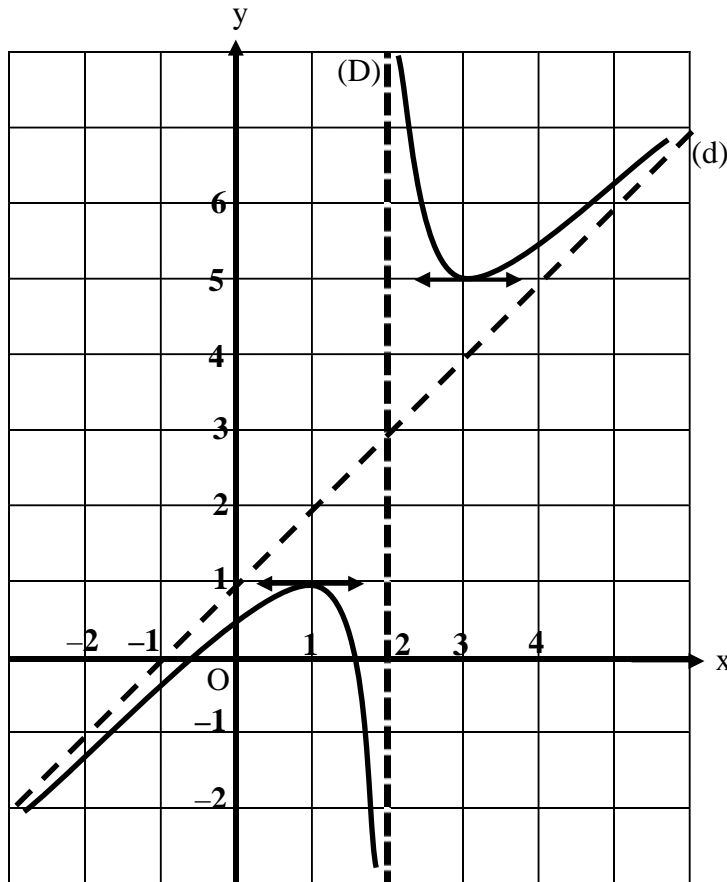
1) Determine $\lim\limits_{x \to +\infty} f(x)$ and $\lim\limits_{x \to -\infty} f(x)$.

2) Find the equations of the asymptotes of (C).

3) Solve each of the following three equations : $f(x) = 1$; $f(x) = 5$; $f'(x) = 0$.

4) Solve each of the following two inequalities: $f(x) > 3$; $f'(x) \le 0$.

5) Set up the table of variations of f.

6) Knowing that $f(x) = ax + b + \dfrac{1}{x + c}$, show that $a = b = 1$ and $c = -2$.

7) Prove that $I(2 \; ; 3)$ is a center of symmetry of (C).

BAREME		2nd SESSION 2006

Q I	ANSWERS	M
1	Let x be the initial price of the coat and y that of the jacket . $\begin{cases} x + y = 650\ 000 \\ 0.85x + 0.8y = 540\ 000 \end{cases}$ x = 400 000 and y = 250 000 The price of the coat is 400 000LL ,and that of the jacket is 250 000LL	2 ½
2	The price of the coat after the discount is : $400\ 000 \times 0,85 = 340\ 000$LL The price of the jacket after the discount is : $540\ 000 - 340\ 000 = 200\ 000$LL ▶OR : $250\ 000 \times 0.8 = 200\ 000$LL	1 ½

QII	ANSWERS	M
1	Using a calculator : $\overline{X} = 866{,}666$ The average monthly salary is 866 666 LL	1
2	The modal class is: $[800 ; 1\ 000[$; the mode is approximately equals to 900. The most frequent salary is 900 000LL ▶OR :The salary corresponding to the highest frequency is 900 000LL.	2
3.a	$P(S < 1\ 000\ 000) = \dfrac{8+16+20}{60} = \dfrac{44}{60} = \dfrac{11}{15}$.	1 ½
3.b	$P[(S < 1\ 200\ 000) / (S \geq 1\ 000\ 000)] = \dfrac{10}{16} = \dfrac{5}{8}$.	1 ½

QIII	ANSWERS	M
1	$\lim\limits_{x \to +\infty} f(x) = +\infty$ and $\lim\limits_{x \to -\infty} f(x) = -\infty$	1
2	Equation of (D) : x = 2 Equation of (d) : y = ax + b with 1 = 0 + b and 0 = − a + b ; a = 1 and b = 1; (d) : y = x +1	2
3	➜f(x) = 1 for x = 1 ; ➜f(x) = 5 for x = 3 ; ➜ f '(x) = 0 for (x = 1 ou x = 3)	1 ½
4	f(x) > 3 for x = 1 f '(x)≤ 0 ; f is decreasing ; 1≤ x < 2 or 2 < x ≤ 3	1 ½
5		1 ½
6	The line of equation x = 2 is a vertical asymptote of (C) ; c = − 2 The line of equation y = x + 1 is an oblique asymptote of (C) ; $f(x) = x + 1 + \dfrac{1}{x-2}$ Hence a = b = 1 ▶OR : f(1) = 1 and f(3) = 5 give a+b = 2 and 3a + b = 4 ; a = b = 1	1 ½
7	$f(2 - x) + f(2 + x) = 3 + x + \dfrac{1}{x} + 3 - x + \dfrac{1}{-x} = 6 = 2 \times 3$ I(2 ; 3) is a center of symmetry of (C).	1