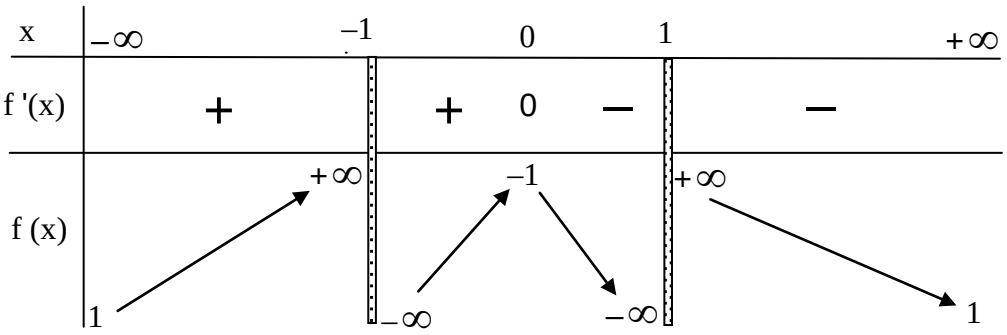
وزارة التربية والتعليم العالي المديرية العامة للتربية دائرة الامتحانات	امتحانات الشهادة الثانوية العامة فرع الآداب والإنسانيات	دورة سنة ٢٠٠٥ الاستثنائية
عدد المسائل : ثلاث	مسابقة في مادة الرياضيات المدة: ساعة واحدة	الاسم: الرقم:

ملاحظـة : يُسمح بإستعمال آلة حاسبة غير قابلة للبرمجة أو إختزان المعلومات أو رسم البيانات.
يستطيع المرشح الإجابة بالترتيب الذي يناسبه (دون الالتزام بترتيب المسائل الوارد في المسابقة)

I-(10 points)

Shown below is the table of variations of a function f :



Designate by (C) the representative curve of f in an orthonormal system.

Part A

1) Determine the domain of definition of f.
2) Give the equations of the asymptotes of (C).
3) What is the number of solutions of the equation f(x) = 3 ?
4) Solve the inequality f(x) < 0.
5) Compare f(2) and f(3), with justification.
6) Write an equation of the tangent to (C) at the point A(0 ;-1).
7) Draw the curve (C).

Part B

In this part we let $f(x) = \dfrac{ax^2 + 1}{x^2 + b}$.

1) Use the table of variations of f to determine the values of a and b.
2) Solve the equation f(x) = 3.

II-(5 points)

The students of the third secondary class in a certain school are 60 girls and 90 boys.
Two thirds of the girls and **half** of the boys are members in a sports activity.

A student is randomly chosen from this class.
Consider the following events:

G: « The chosen student is a girl ».
B: « The chosen student is a boy ».
S: « The chosen student is a member in a sports activity ».

1) Calculate the following probabilities:
$P(G)$, $P(B)$, $P(S/G)$, $P(S/B)$, $P(S \cap G)$, $P(S \cap B)$ and $P(S)$.

2) Calculate the probability of the event:
« The chosen student is a boy knowing that he is a member in a sports activity ».

III-(5 points)

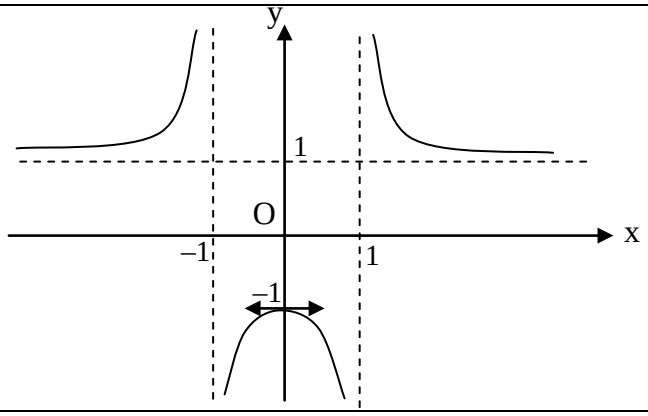
A TV set, that has an initial price of 600 000 LL, is subject to two successive price discounts.
The first discount percentage is 15%.

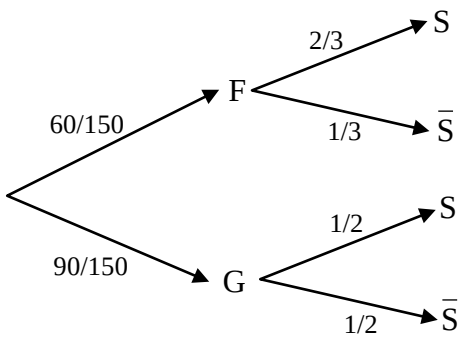
1) Calculate the price of this TV set after the first discount.

2) Knowing that the price of this TV set becomes 408 000 LL after the second discount.
a- What is the percentage of the second discount?
b- Calculate, in percentage form, the total reduction in the price of this TV set after the two discounts

L.H-MATHS

2nd session 2005

Q1	Answers	M
A1	$D_f =]-\infty ; -1[\cup]-1 ; 1[\cup]1 : +\infty[$	½
A2	The equations of the asymptotes are : $x = -1$, $x = 1$, $y = 1$.	1½
A3	$f(x) = 3$ has two solutions.	½
A4	$f(x) < 0$ for $x \in]-1 ; 1[$	1
A5	$f(2) > f(3)$ since f is strictly decreasing on $]1 : +\infty[$.	1 ½
A6	$y = -1$.	½
A7		2
B1	$f(0) = -1$ gives $b = -1$ • OR : $x = 1$ and $x = -1$ are the equations of the asymptotes, so $b = -1$. $\lim_{x \to +\infty} f(x) = a = 1$.	1 ½
B2	$f(x) = 3$; $\frac{x^2+1}{x^2-1} = 3$; $x^2 + 1 = 3x^2 - 3$; $x^2 = 2$; $x = -\sqrt{2}$ or $x = \sqrt{2}$.	1

Q2	Answers		M
1		P(F) = 60/150 = 2/5 P(G) = 90/150 = 3/5 P(S/F) = 2/3 P(S/G) = 1/2 $P(S \cap F) = (2/5)\times(2/3) = 4/15$ $P(S \cap G) = (3/5)\times(1/2) = 3/10$ $P(S) = P(S \cap F) + P(S \cap G) = 4/15 + 3/10 = 17/30$	3 ½
2	$P(G/S) = P(S \cap G) / P(S) = (3/10) \div (17/30) = 9/17$		1 ½

Q3	Answers	M
1	The price after the first discount is : 600 000(1 – 0.15) = 510 000 LL	1 ½
2.a	Let x be the percentage of the 2nd discount; $510\,000(1 - \frac{x}{100}) = 408\,000$; $x = 0.2$, it is 20% .	2
2.b	Let y be the required reduction ; $600\,000(1 - \frac{y}{100}) = 408\,000$; $y = 0.32$, it is 32 %.	1 ½