

المادة: الرياضيات الشهادة: الثانوية العامة الفرع: الآداب والإنسانيات نموذج رقم ١- المدة : ساعة واحدة	الهيئة الأكاديمية المشتركة قسم : الرياضيات	 المركز العربي للبحوث والآراء
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نموذج مسابقة (يراعي تعليق الدروس والتوصيف المعدل للعام الدراسي ٢٠١٦-٢٠١٧ وحتى صدور المناهج المطورة)

ارشادات عامة : - 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- (5 points)

A Shop sells phone books. At the beginning of the season, the prices of a phone and an IPAD together is 1 800 000 LL. At the end of the season, after a 30% decrease in the price of the phone and 25% increase in the price of the IPAD, the prices together become 1 920 000 LL.

- 1) Find the price of the phone and the price of the IPAD at the beginning of the season.
- 2) Find the price of the phone and the price of the IPAD at the end of the season.
- 3) Samir wants to buy 5 phones and 2 IPADs. Is it profitable for him to buy them at the beginning or at the end of the season? Justify your answer.

II- (5 points)

An auto company has 400 vehicles in its stores. These vehicles could be cars or jeeps. For each kind of vehicles, there are American and German.

A statistical study showed that:

- 40% of the vehicles are jeeps
- 30% of the cars are American
- 65% of the jeeps are German

- 1) Copy and complete the following table.

	Car	Jeep	Total
American			
German			
Total			400

- 2) A customer comes and chooses at random one vehicle from the company.
 - a- Calculate the probability of choosing a car.
 - b- Calculate the probability of choosing a German jeep.
 - c- Calculate the probability of choosing a jeep knowing that it is American.
 - d- Calculate the probability of choosing a car or a jeep.
- 3) Two customers come and choose two vehicles from the company, one after another.

- a- Calculate the probability of choosing two jeeps.
- b- Calculate the probability of choosing two cars given that they are German.

III- (10 points)

The table below is the table of variations of a function f defined by $f(x) = x + a + \frac{b}{x-c}$, where a , b , and c are three real numbers. Designate by (C) its representative curve in an orthonormal system $(O, \vec{i}, \vec{j})$.

x	$-\infty$	1	3	5	$+\infty$
$f'(x)$		0		0	
$f(x)$		1		$+\infty$	
			$-\infty$		9

- 1) Determine the domain of definition of f .
- 2) Calculate c , then a and b .
- 3) Write an equation of the tangent to (C) at the point of abscissa 5.

In what follows, suppose that $a = 2$, $b = 4$, and $c = 3$.

- 4)
 - a- Find the limits of f at $-\infty$ and at $+\infty$.
 - b- Show that the straight line (d) of equation $y = x + 2$ is an asymptote to (C) .
- 5) Verify that $f'(x) = \frac{(x-5)(x-1)}{(x-3)^2}$, then copy and complete the above table of variations.
- 6) Draw (C) and its asymptotes.

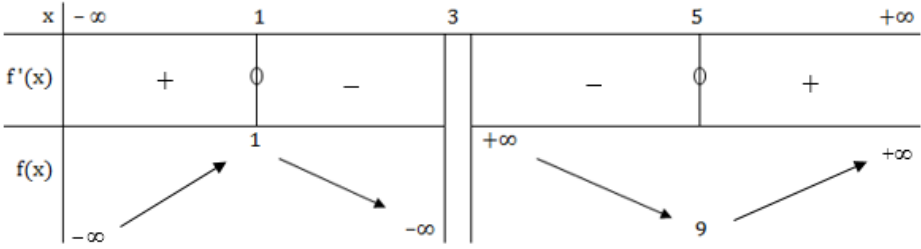
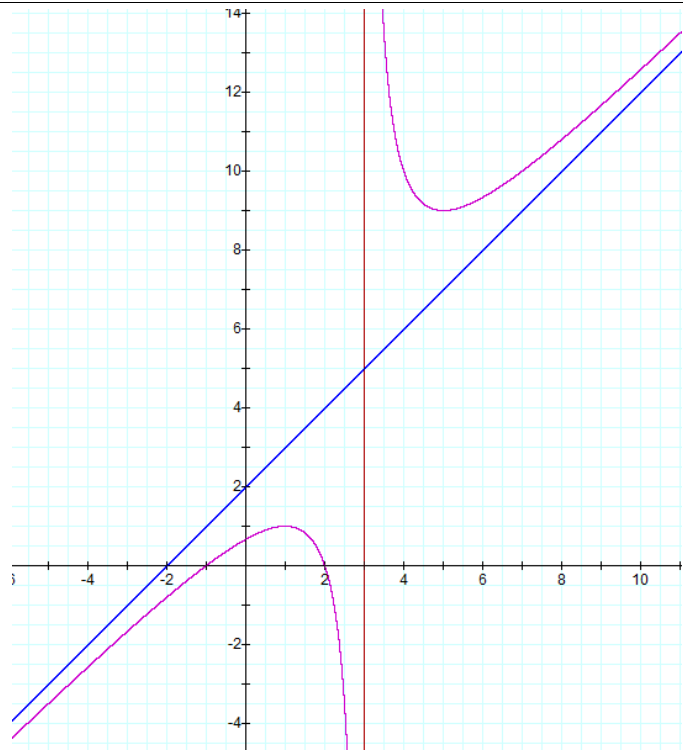
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أسس التصحيح (تراعي تعليق الدروس والتوصيف المعدل للعام الدراسي ٢٠١٦-٢٠١٧ وحتى صدور المناهج المطورة)

Answer Key

Question I					Mark
1)	Gender/Section	[14,16[	[16,18[	[18,20]	Total
	Boys	15	8	2	25
	Girls	3	10	12	25
	Total	18	18	14	50
2)	a. $\frac{3}{50}$				1
	b. $P(G \text{ or } age \geq 18) = \frac{25}{50} + \frac{14}{50} - \frac{12}{50} = \frac{27}{50}$				1
	c. $P(B / Age \geq 18) = \frac{2}{14} = \frac{1}{7}$				1
3)	$P(BG \text{ or } GB) = \frac{25}{50} \cdot \frac{25}{49} + \frac{25}{50} \cdot \frac{25}{49} = \frac{25}{49}$				1

Question II					Mark
1)	x : original price of a pen y : original price of a copybook				1
2)	From the given we get the following system $\begin{cases} x + y = 4(0.8x) \\ 0.8x + 0.8y = 16000 \end{cases}$ $x = 6250LBP$ $y = 13750LBP$ $0.8x = 5000 LBP$ $0.8y = 11000 LBP$				2
3)	Rima should pay a sum equals to: $2 \times 5000 + 3 \times 11000 = 43000 LBP$				1

Question III		Mark
1)	$] -\infty, 3[\cup] 3, +\infty[$	0.5
2)	$c = 3; a = 2; b = 4$	1.5
3)	$y = 9$	1
4)	a- $-\infty; +\infty$	1
	b- limit is 0	1
5)	$f'(x) = \frac{x^2 - 6x + 5}{(x-3)^2} = \frac{(x-5)(x-1)}{(x-3)^2}$ 	1
		2.5
6)		2.5