ليسه دي زار

الشهادة المتوسطة التجربة الثانية لعام 2007 - 2008

مسابقة في الرياضيات الانكليزي	المدّة : ساعتين	الإسم :	الرقم :

ارشادات عامة: – **عدم استخدام الآلة الحاسبة**

- **الكتابة بخط واضح ومقروء دون تشطيب**
- **عدد المسائل 6 وجميعها إلزامية.**
- **العلامة القصوى 30.**

1st exercise: (5pts)

Choose the correct answer and justify

No.	Questions	Answers		
		a	b	c
1.	$\left(-3\sqrt{2}\right)^2 =$	-18	12	+18
2.	$\frac{1}{3}+\frac{3}{4}+\frac{3}{8} =$	$\frac{5}{24}$	$\frac{7}{8}$	$\frac{35}{24}$
3.	If $x=-3\sqrt{2}$ then: $x^2+6\sqrt{2}x+19 =$	$19-9\sqrt{2}$	$19+27\sqrt{2}$	1
4.	$\left(3x+\frac{1}{2}\right)^2 =$	$9x^2+\frac{1}{4}$	$9x^2+\frac{3}{2}x+\frac{1}{4}$	$9x^2+3x+\frac{1}{4}$
5.	If $A=\left(\frac{3}{5}-\frac{5}{2}\times\frac{-1}{10}\right)\div\left(1-\frac{3}{20}\right)$ then A =	1	$\frac{7}{17}$	$\frac{1}{2}$
6.	$\frac{7^3\times5^{-4}}{49\times5^{-6}\times7} =$	5^{-10}	25	7×5^2
7.	$2^3 + 2^{-3} =$	2^0	0	$\frac{65}{8}$
8.	$\sqrt{(3-5)^2} =$	4	-2	2
9.	$\sqrt{169}+\sqrt{196} =$	$\sqrt{365}$	$\sqrt{27}$	27
10.	$(x - 1)^3 =$	$x^3 - 2x + 1$	$x^3 - 1$	$x^3 - 3x^2 + 3x - 1$

2nd exercise: (4pts)

1. Find the positive integer A such that: $\sqrt{A}=\sqrt{13}\times\sqrt{31}$. (1pt)
2. Given $B=\frac{5.6\times10^4\times10^{-3}}{8\times10^{+2}}$. Write B in the form $a\times10^n$ where a and n are two integers, then write B in decimal form. (1pt)
3. Let $D=1-\left(\sqrt{2001}+\sqrt{2000}\right)\left(\sqrt{2001}-\sqrt{2000}\right)$. Verify that D = 0. (1pt)
4. Let $m=14\times\sqrt{\frac{7}{3}}\times\sqrt{\frac{27}{343}}$. Show that m is an integer. (1pt)

3rd exercise: (6 pts)

Given that: $A = 2(x-2)^2 - 3(2-x)$ and $B = (x-2)(2x^2-2) + (x-2)(x+1)$.

1. Expand, reduce, and order A and B. (1pt)
2. a) Write A as a product of two factors of first degree. (1pt)
   b) Show that B = (x - 2) (x + 1) (2x – 1). (1pt)
3. Let $F = \frac{B}{A}$
   a) Find the values of x, so that F is defined. (1pt)
   b) Simplify F. (½ pt)
4. Let Q = (6x – 5) (x -1) + 12x – 10
   a) Show that Q = (6x -5) (x + 1). (½ pt)
   b) Calculate the values of x so that: F = Q. (1pt)

4th exercise: (5pts)

Consider a straight – line (d) and M, N, and P are three points taken in this order on (d) such that: MN=6cm and NP=4cm. Let (C) be the circle of diameter [MN] and (C') the circle of diameter [NP]. Let A be a point of (C) such that MA=2cm. the straight – line (AN) cuts (C') in B.

1. Draw a figure. (1pt)
2. a) Calculate AN. (1pt)
   b) Show that (MA) and (PB) are parallel. (1 ½ pts)
3. Calculate PB and BN. (1 ½ pts)

5th exercise: (2pts)

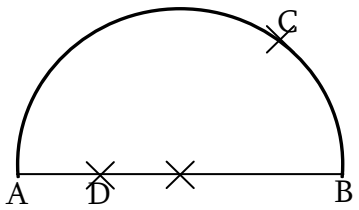
Consider a circle of center O and radius R. A is a fixed point on (C) and M is a variable point on (C). The tangents at A and M t o (C) intersect at E. (OE) and (AM) intersect at P.

Determine the locus of P as M varies on (C).

Remark: draw a figure.

6th exercise: (8pts)

Consider to the right a semi – circle of diameter [AB]. Let D be a point of [AB] and C a point on the semi–circle. Through D, draw the perpendicular to [AB] that cuts the semi-circle at M. the tangent at C cuts (DM) at G. (DM) cuts (AC) and (BC) at E and F respectively.



1. Reproduce and complete the figure. (1pt)
2. Show that the quadrilateral ADCF is inscribed in a circle whose center I is to be determined. (1 ½ pts)
3. a) Show that the four points B, C, E and D belong to the same circle. (1pt)
   b) Deduce that:
      i. $D\hat{B}C = C\hat{E}G$. (1pt)
      ii. The triangle EGC is isosceles at vertex G. (1 ½ pts)
4. a) Show that the triangle FGC is isosceles at G. (1pt)
   b) Deduce that the point G is the center of the circle circumscribed about triangle EFC. (1pt)