التجربة الأولى لعام 2006 - 2007   الشهادة المتوسطة

مسابقة في الرياضيات الانكليزي	المدّة : ساعتين	الإسم :	الرقم :

1st exercise: (2 ¼ pts)

1. **a.** Develop then reduce $(x-1)^2 - x(x-2)$
   b. Deduce the value of $897^2 - 898 \times 896$.
2. Given $E(x) = \frac{3x^2-4}{4-x^2} + \frac{4}{2-x} - \frac{2}{2+x}$
   a. Determine the domain of definition of E(x).
   b. Prove that $E(x)=\frac{3x}{2-x}$

2nd exercise: (2pts)

Given $A=\sqrt{12}-\sqrt{72}+\sqrt{3}+\sqrt{18}$
$B=\sqrt{27}+\sqrt{50}-\sqrt{32}-\sqrt{12}$

1. Simplify and reduce A and B
2. Calculate $\frac{A}{A-B}$ and rationalize the denominator of the obtained expression.

3rd exercise: (2 ¼ pts)

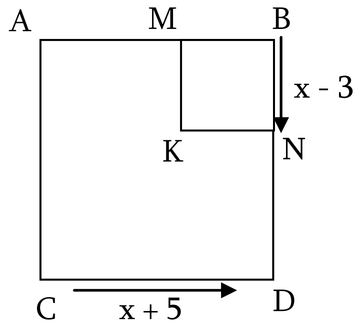
Given a rectangle ABCD such that $AB=\sqrt{4+\sqrt{7}}$, $BC=\sqrt{\frac{7}{2}}+\sqrt{\frac{1}{2}}$

1. Prove that ABCD is a square.
2. Develop $(\sqrt{7}+1)^2$
3. Calculate the radius of the circle circumscribed about triangle ABC.

4th exercise: (2pts)

Given $F(x)=[x+5]^2 - 16$

1. Factorize F(x)
2. Solve the equation $(x+1)(x+9)=0$
3. On the figure ABCD is a square with side (x + 5). For What valves of x the area of ABCD is four times the area of the square MBNK of side equal x – 3.



5th exercise: (3 ½ pts)

Given $A(x)=(x-1)^3-2(x-1)(x+3)$
$B(x)=(2x-3)(x-2)^2-18x+27$

1. Factorize B(x) and prove that A(x) = (x-1) (x-5) (x+1)
2. Let $F(x)=\frac{B(x)}{A(x)}$
   a. Find the domain of definition of F(x).
   b. Simplify F(x).
3. Calculate the value of F(x) for $x=\sqrt{2}$, and rationalize its denominator.
4. Calculate x such that $F(x)=\frac{\sqrt{3x^2-6x}}{x-1}$

6th exercise: (3pts)

Consider the polynomial E(x)= $(5-3x)^2+(9x^2-25)+2(5-3x)(4x+3)$

1. Develop, reduce and order E(x)
2. Calculate m, n and p such that F(x)= $(3x-5)(mx^2+nx+p)$ is identical to E(x)

7th exercise: (5pts)

Draw a circle (C) of center O and diameter AB = 10cm. Let I be the midpoint of [OB], and (d) be the perpendicular to [AB] at I cuts the circle at M. J be a point on (d) such that MJ = 2IM.

1. Calculate AM such that IM = $2.5\sqrt{3}$
2. Calculate IJ and JB.
3. Prove that AJ = 2 IA
4. Deduce the nature of triangle AIJ.