Lycée Des Arts

Name / Nom : ……………..……………………………………...………..

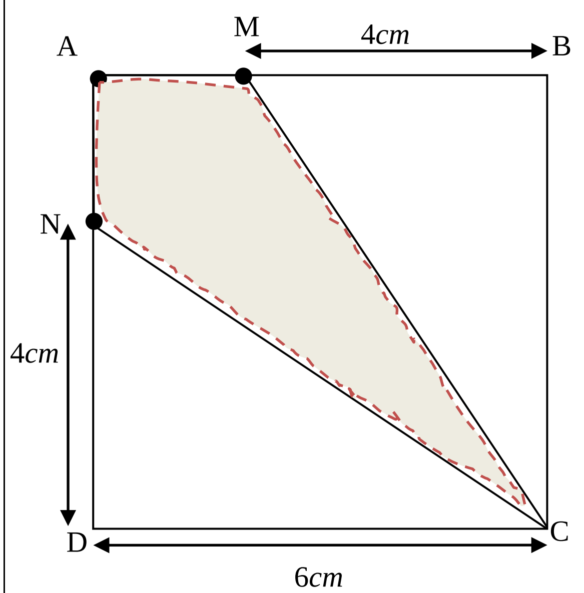
Class / Classe : *Grade 8*   Section: …….   Date : ……..…………….

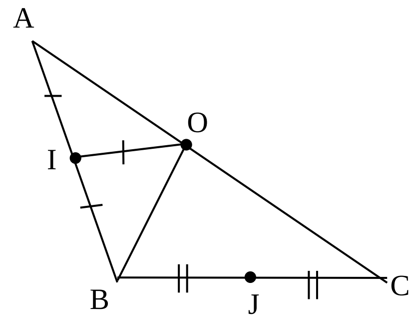
Exam in / Examen de: ***Math***   ***Midterm***

يمنع استعمال الآلة الحاسبة

Exercise 1:(11 pts)

In the following table, ***only one*** of the proposed answers is correct. Indicate it and ***justify*** your choice.

№	Questions	Answers A	Answers B	Answers C
1	In the following figure we have :  $ABCD$ is a square of side 6cm. M and N are two points on $[AB]$ and $[AD]$ respectively such that: $MB = DN = 4$cm. The area of the shaded part represents the……………...(2½ pts)	$\frac{1}{3}$ of the area of the square	$\frac{1}{4}$ of the area of the square	$\frac{1}{5}$ of the area of the square
2	If $A = \left(\frac{4}{3}\right)^{-1} - \frac{3+\frac{5}{4}}{5-\frac{1}{7}}$ and $B = \frac{96\times10^{-6}\times(-5)\times10^{-1}}{2^{-6}\times3\times5^{-6}\times2}$ Then A is ………..(2 pts)	The reciprocal of B	The opposite of B	Equal to B

3	In the following figure we have :  • ABC is a triangle and O belongs to $[AC]$. • I is the midpoint of $[AB]$. • $IO = IA = IB$. • J is the midpoint of $[BC]$. Then the triangle OJC is……… (2 pts)	Isosceles at J	Equilateral	Rectangle at J.
4	Given $F = \frac{3x-5}{5x-2} + \frac{16-9x}{4-10x}$. Then F is:…………(1¼ pts)	A literal fraction for $x \neq \frac{2}{5}$	A decimal fraction	Not Decimal
5	The approximate value of : $A = \dfrac{2+\frac{1}{3}+\frac{1}{1+\frac{1}{3}}}{1-\frac{1}{2}}$ to the nearest hundredths by excess is ……….(1¼ pts)	6,2	6,16	6,17
6	(S) is a circle of center O and diameter $[AB]$. C is a point of (S) and D is the symmetric of B with respect to C. The lines (AC) and (DO) intersect at E. The line (BE) in the triangle ABD is …(2 pts)	A median	An angle bisector	A height

Exercise 2: (10½ pts)

Given the following algebraic expressions:

$G(x) = 4(x-1)^2 - (3x+2)^2$ and $H(x) = (x+4)^2 - (x+3).(x+4) + 2x^2 - 32$

1) a) Expand and reduce $H(x)$. (1pt)

   b) Solve $H(x) = -28$. (1pt)

2) a) Show, **by factorizing**, that: $G(x) = -5x.(x+4)$ and $H(x) = (x+4).(2x-7)$.(2 pts)

   b) Deduce the roots of $G(x)$. (1 pt)

3) Let $SALI$ be a parallelogram such that $SA = G(x)$ and $AL = H(x)$.

   a) Does the side $[SA]$ exist for $x = -4$? **Justify.** (¾ pt)

   b) Calculate the numerical value of AL for $x = 1$. What do you notice? (¾ pt)

   c) Is there any value of x for which $SALI$ is a rhombus? Justify. (1¼ pts)

4) We consider the fractional expression $R(x)$ defined by: $R(x) = \dfrac{G(x)}{H(x)}$.

   a) Determine the domain of definition of $R(x)$, then simplify it.(1¼ pts)

   b) Calculate $R(-\frac{1}{2})$. (½ pt)

   c) Is there any value of x such that $R(x) = -\frac{5}{2}$? **Justify.** (1pt)

Exercise 3: (8½ pts)

Let ABC be a right triangle at A such that $BC = 6cm$ and $A\hat{B}C = 30^o$. $[AH)$ is the height relative to $[BC]$. A' is the symmetric of A with respect to H, and M is the midpoint of $[BC]$.

1) Draw a clean figure. (½ pt)
2) Prove that the triangles ACH and $A'CH$ are congruent, then deduce the measure of angle $\widehat{A'CB}$.(1½pts)
3) a) Calculate AM, then deduce that ACM is an equilateral triangle.(1pt)

   b) Show that $CAMA'$ is a rhombus.(1pt)
4) Show that the triangles ACB and $A'CB$ are congruent then deduce that $[BC)$ is the angular bisector of $\widehat{ABA'}$. (1½ pts)
5) Draw: (½ pt)

   * H' the symmetric of H with respect to A.
   * C' the symmetric of C with respect to A.
   * M' the symmetric of M with respect to A.

   a) Determine the nature of the quadrilateral $CHC'H'$. (¾ pt)

   b) Prove that $C'H' = 1.5\ cm$. (½ pt)

   c) Prove that $CC' = MM'$, then deduce that the quadrilateral $CMC'M'$ is a rectangle.(1¼ pts)

Good work