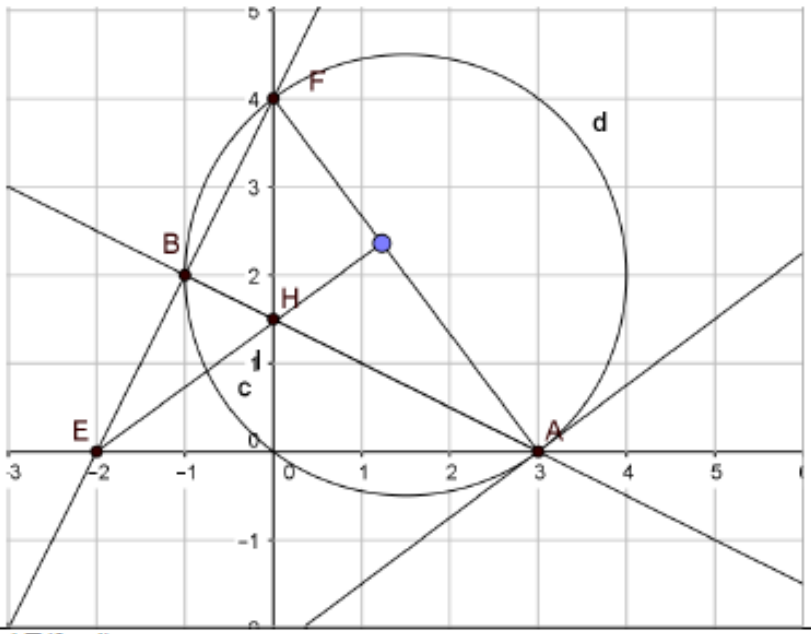
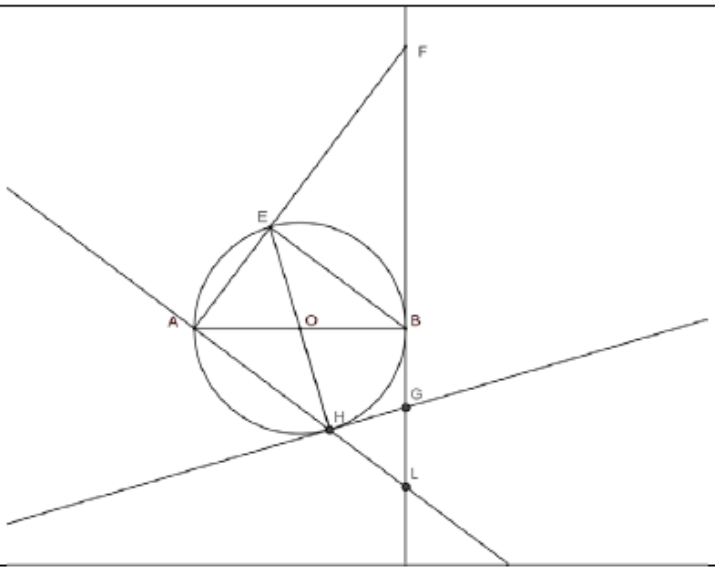
المركز التربوي للبحوث والإنماء	الهيئة الأكاديمية المشتركة قسم : الرياضيات	المادة: الرياضيات الشهادة: المتوسطة نموذج رقم -١- المدة : ساعتان

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

	Question I	
	Answers	**note**
1	$A=\frac{33\times10^{-4}\times30\times10^{2}}{36\times10^{-2}\times22\times10}=\frac{9\times10^{-1}}{72\times10^{-1}}=\frac{1}{8}$ ¼ + ¼ $B=\frac{\frac{10}{3}}{\frac{5}{6}}=4$, ¼ + ¼ $C=(\sqrt{2}-1)^2+(\sqrt{2}+1)^2=2-2\sqrt{2}+1+2+2\sqrt{2}+1=6$ ¼ + ¼ +¼	1¾
2	$16A+B=2+4=30$ C = 6 , so C = B +16A.	¼
	Question II	
a	2x +2y=28cm 2(1-0,1)x+2(1+0.2)y=28.8cm	1¼
b	x=8, y= 6	1
c	1,2y=7.2 et 0,9x =7.2 Therefore the quadrilateral is a square.	¾
	Question III	
1	Area of hatched area Y = $24-\frac{(4-x)(6-x)}{2}=\frac{-x^2+10x+24}{2}=-\frac{1}{2}(x^2-10x-24)$.	1
2.b	$20=-\frac{1}{2}((x-5)^2-49)$ alors$(x-5)^2-49=-40, (x-5)^2=9$ x-5=3 or x-5=-3 so x=8(unacceptable) ou x=2. ¼ + ¼ +¼ + ¼ +¼	1¼
3.a	$Z=(x+2)^2$	¼
3.b	$\frac{Y}{Z}=\frac{\frac{1}{2}(x-12)(x+2)}{(x+2)^2}=\frac{\frac{1}{2}(x-12)}{(x+2)}=\frac{-(x-12)}{2(x+2)}$ (with $x\neq-2$)	½
3.c	Y= Z so $\frac{-(x-12)}{2(x+2)}=1$ then $-(x-12)=2(x+2)$ so x= $\frac{8}{3}$ acceptable.	1

Question IV		
1.a		½
1.b	E(0;-2) and F(0 ; 4)	½
1.c	$x_B = \frac{(xE+xF)}{2}$ $y_B = \frac{(yE+yF)}{2}$	½
2.a	The equation of (AB) : y = a x+b $a(AB) = \frac{(yB-yA)}{(xB-xA)} = \frac{-1}{2}$ and $y_B = \frac{-1}{2} x_B + b$ so $b = \frac{3}{2}$.	¾
2.b	slope (AB) × slope (d) = -1 and (AB) through B middle of [EF] so (AB) is the mediator of [EF].	½
3.a	$y_H = \frac{-1}{2} x_H + \frac{3}{2}$. so H is a point of (AB)	¼
3.b	(FH) ⊥ at (EA) and (AB) ⊥ at (EF) , (AB) and (FH) meet in H then H is the orthocenter of the triangle AEF.	¾
4.a	$\widehat{ABF} = 90°$ (ABF triangle inscribed in a semicircle of diameter [AF]) $\widehat{AOF} = 90°$ (AOF triangle inscribed in a semicircle of diameter [AF]) Therefore B and O are two points of the circle.	½
4.b	The equation of (Δ) : y = a x+b $a(\Delta) = a(EH) = \frac{(yE-yH)}{(xE-xH)} = \frac{3}{4}$ and $y_A = \frac{3}{4} x_A + b$ so $b = \frac{9}{4}$.	¾
4.c	(EH) ⊥ at (FA) and (Δ)//at (EH) then (Δ)⊥ at (FA) in A so (Δ) is tangential to the circle (C) in A.	½

	Question V	
1		½
2.a	In the triangle AEB rectangle in E. According to Pythagoras $BE^2 = AB^2 - AE^2$, BE = 4.	½
2.b	The two triangles BDE and BAD are similar because: $\hat{A}$ common angle $\widehat{AEB} = \widehat{ABF} = 90$	½
2.c	Similarity ratio: $\frac{AE}{AB} = \frac{AB}{AF} = \frac{EB}{BF}$ ¼ $\frac{3}{5} = \frac{5}{AF} = \frac{4}{BF}$ so BF=$\frac{20}{3}$ and AF=$\frac{25}{3}$ so EF=$\frac{25}{3} - 3 = \frac{16}{3}$.	½
3.a	$\frac{EF}{EA} = \frac{16}{9}$ so $\frac{FB}{BL} = \frac{16}{9}$.	½
3.b	$\frac{EF}{EA} = \frac{FB}{BL}$, then the two straight lines (EB) and (AL) are parallel according to the reciprocal of Thales.	½
3.c	$\frac{EF}{FA} = \frac{EB}{AL}$ so AL=$\frac{15}{4}$.	½
4.a	The two triangles HBL and BAH are similar because $\widehat{BAH} = \widehat{HBL} = \frac{\widehat{AB}}{2}$ $\frac{AH}{HB} = \frac{4}{3}$ and $\frac{AB}{BL} = \frac{4}{3}$ so $\frac{AH}{HB} = \frac{AB}{BL}$ And consequently $\widehat{BHL} = \widehat{ABL} = 90$ then $\widehat{BHL}+\widehat{BHA}$ =180 so H is on (AL).	**1**
5.b	In the triangle BHL rectangle in H on HG = GB = GL (the median is half the hypotenuse) Then the two triangles OBG and OHG are isometric. $\widehat{GHO} = \widehat{OBL} = 90$ then BH tangent to (C).	½
5.c	$\cos \widehat{GBH} = \frac{BH}{BL} = \frac{3}{\frac{15}{4}} = \frac{4}{5}$ Alors $\widehat{GBH} = cos^{-1}\left(\frac{4}{5}\right)$=36,8°≈ 37°	½