

Higher Grade - Paper 1 2007/2008

ANSWERS - Section A

- 1 D
- 2 B
- 3 C
- 4 C
- 5 C
- 6 D
- 7 A
- 8 C
- 9 D
- 10 B
- 11 B
- 12 C
- 13 D
- 14 A
- 15 D
- 16 C
- 17 D
- 18 D
- 19 B
- 20 A

	A	B	C	D
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2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	Give 1 mark for each •	Illustration(s) for awarding each mark	
21(a)	ans: proof (3 marks) <ul style="list-style-type: none"> •¹ finds expressions for 2 areas •² adds 4 to area of triangle and equates •³ reorganises to given form 	<ul style="list-style-type: none"> •¹ $A_{rect} = x(2k - 2); A_{tri} = x(x + k)$ •² $x(x + k) + 4 = x(2k - 2)$ •³ $x^2 + (2 - k)x + 4 = 0$ 	
	(b) ans: $k = 6$ (3 marks) <ul style="list-style-type: none"> •¹ knows condition for equal roots •² substitutes values •³ solves and discards 		<ul style="list-style-type: none"> •¹ $b^2 - 4ac = 0$ [stated or implied] •² $(2 - k)^2 - 4 \times 1 \times 4 = 0$ •³ $(k + 2)(k - 6) = 0; k = -2$ or $6; k = 6$
	(c) ans: $x = 2; 20cm^2; 16cm^2$ (3 marks) <ul style="list-style-type: none"> •¹ substitutes value of k to form quadratic •² solves to x •³ finds areas 		
22(a)	ans: $3y + x = -30$ (2 marks) <ul style="list-style-type: none"> •¹ identifies required gradient •² substitutes into general equation 	<ul style="list-style-type: none"> •¹ $m_{CB} = -\frac{1}{3}$ •² $y + 11 = -\frac{1}{3}(x - 3)$ [or equivalent] 	
	(b) ans: D(-3,-9) (3 marks) <ul style="list-style-type: none"> •¹ knows to use systems of equations •² finds value for x •³ finds value for y and states coordinates 		<ul style="list-style-type: none"> •¹ evidence •² $x = -3$ •³ $y = -9; (-3, -9)$
	(c) ans: C(-9,-7) (1 mark) <ul style="list-style-type: none"> •¹ states coordinates of C 	<ul style="list-style-type: none"> •¹ C(-9,-7) 	
	(d) ans: $(x + 3)^2 + (y - 1)^2 = 100$ (4 marks) <ul style="list-style-type: none"> •¹ identifies diameter •² finds centre •³ finds radius or r^2 •⁴ subs into general equation 	<ul style="list-style-type: none"> •¹ AC is diameter [$\angle ADC$ is right-angled] •² midpoint of AC is (-3,1) •³ $r = 10$ or $r^2 = 100$ •⁴ $(x + 3)^2 + (y - 1)^2 = 100$ 	

	Give 1 mark for each •	Illustration(s) for awarding each mark
23(a)	<p>ans: $(x - 4)^2 - 15$; $p = -4$, $q = -15$ (4 marks)</p> <ul style="list-style-type: none"> •¹ finds derivative •² starts to complete square •³ completes •⁴ states values of p and q 	<ul style="list-style-type: none"> •¹ $f(x) = x^2 - 8x + 1$ •² $(x - 4)^2 \dots\dots\dots$ •³ $\dots\dots\dots -15$ •⁴ $p = -4$, $q = -15$
(b)	<p>ans: -15 when $x = 4$ (2 marks)</p> <ul style="list-style-type: none"> •¹ states minimum rate of change •² states value of x 	<ul style="list-style-type: none"> •¹ rate of change is -15 •² $x = 4$
24	<p>ans: $\frac{2\pi}{3}, 0$ (5 marks)</p> <ul style="list-style-type: none"> •¹ collects terms to LHS and equates to 0 •² factorises quadratic •³ finds values for $\cos a$ •⁴ finds one value for a •⁵ finds second value for a 	<ul style="list-style-type: none"> •¹ $2\cos^2 a - \cos a - 1 = 0$ •² $(2\cos a + 1)(\cos a - 1) = 0$ •³ $\cos a = -\frac{1}{2}$ or $\cos a = 1$ •⁴ $\frac{2\pi}{3}$ •⁵ 0
		Total: 30 marks