EDEXCEL CORE MATHEMATICS C1 **PRACTICE PAPER A4 MARK SCHEME**

Question number		Scheme	Marks
1.	(a)	$3x - x > 13 + 8$ $x > \frac{21}{2}$	M1, A1 (2)
	(b)	$x^2 - 5x - 14 > 0$ $(x - 7)(x + 2) > 0$ $x = 7, -2$	B1
		$x < -2$ or $x > 7$	M1, A1 ft (3)
			(5 marks)
2.	(a)	$x = -\frac{1}{2}$	B1
		$4 = 2^2$ and $\sqrt{2} = 2^{\frac{1}{2}}$, $y = 2^{\frac{1}{2}}$	M1, A1 (3)
	(b)	$y - x = 3$ $2^3 = 8$ (or: $4\sqrt{2} \div \frac{1}{\sqrt{2}} = 8$)	M1 A1 (2)
			(5 marks)
3.	(a)	$(x + k)^2$, $-k^2 + c$ (= 0)	M1, A1
		$(x + k)^2 = k^2 - c$ $x = -k \pm \sqrt{(k^2 - c)}$ *	M1 A1 c.s.o (4)
	(b)	(Discriminant = 0, $k^2 = 81$ $k = 9$, or -9	B1, B1 (2)
			(6 marks)
4.	(a)(i)	$a + (n - 1)d = 280 + (35 \times 5) = 455$	M1 A1
	(ii)	$\frac{1}{2}n\,[2a + (n - 1)d\,] = 18\,[560 + (35 \times 5)] = 13\,230$	M1 A1 ft (4)
	(b)	$18\,[560 + (35 \times d)]$ $= 17\,000$	M1 A1
		$d = 10.98\ldots$ $x = 11$ (allow 11.0 or 10.98 or 10.99 or $10\frac{62}{63}$)	M1 A1 (4)
			(8 marks)

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5. (a)	(2, 0) (or $x = 2,\ y = 0$)	B1 (1)
(b)	$y^2 = 4\left(\frac{3y+12}{2} - 2\right)$ or $\left(\frac{2x-12}{3}\right)^2 = 4(x-2)$	M1
	$y^2 - 6y - 16 = 0$ or $x^2 - 21x + 54 = 0$ (or equiv. 3 terms)	A1
	$(y+2)(y-8) = 0$, $y =$…or $(x-3)(x-18) = 0$, $x =$… (3 term quad.)	M1
	$y = -2,\ y = 8$ or $x = 3,\ x = 18$	A1
	$x = 3,\ x = 18$ or $y = -2,\ y = 8$ (attempt <u>one</u> for M mark) (A1ft requires both values)	M1 A1ft (6)
(c)	Grad. of $AQ = \frac{8-0}{18-2}$, Grad. of $AP = \frac{0-(-2)}{2-3}$ (attempt <u>one</u> for M mark)	M1 A1ft
	$m_1 \times m_2 = \frac{1}{2} \times -2 = -1$, so $\angle PAQ$ is a right angle (A1 is c.s.o.)	M1 A1 (4)
	<u>Alternative:</u> Pythagoras: Find 2 lengths [M1]	
	$AQ = \sqrt{320}$, $AP = \sqrt{5}$, $PQ = \sqrt{325}$ (O.K. unsimplified) [A1ft]	
	(if decimal values only are given, with no working shown, require at least 1 d.p. accuracy for M1(implied) A1)	
	$AQ^2 + AP^2 = PQ^2$, so $\angle PAQ$ is a right angle [M1, A1]	
	M1 requires attempt to use Pythag. for right angle at A, and A1 requires correct <u>exact</u> working + conclusion.	**(11 marks)**
6. (a)	AB: $m = -\frac{4}{3}$, BC: $m = \frac{3}{4}$ (s.c. AB: $\frac{4}{3}$, BC: $\frac{3}{4}$ B1)	B1, M1 A1 ft (3)
(b)	$BC = \sqrt{(8^2 + (k-4)^2)}$ ($= \sqrt{(k^2 - 8k + 80)}$)	M1 A1 (2)
(c)	$(k^2 - 8k + 80) = 100$ (Their $BC^2 = 100$)	M1
	$k^2 - 8k - 20 = 0$ $(k - 10)(k + 2) = 0$	M1 A1
	$k = 10$, $k = -2$ (rejected)	A1 (4)
(d)	(11, 6)	B1 B1 (2)
		(11 marks)

Question number		Scheme	Marks
7.	(a)	Integrate: $y = x^3 - 10x^2 + 29x \ (+C)$	M1 A1
		$6 = 8 - 40 + 58 + C \Rightarrow C = -20$ $(y = x^3 - 10x^2 + 29x - 20)$	M1 A1 (4)
	(b)	Substitute $x = 4$: $64 - 160 + 116 - 20 = 0$	M1 A1 (2)
	(c)	At $x = 2$, $\frac{dy}{dx} = 12 - 40 + 29 = 1$	B1
		Tangent: $y - 6 = x - 2$ $(y = x + 4)$	M1 A1 (3)
	(d)	$\frac{dy}{dx} = 1$	M1
		$3x^2 - 20x + 28 = 0$	M1
		$(3x - 14)(x - 2) = 0$	M1 A1
		$x = \frac{14}{3}$	A1 (5)
			(14 marks)