Circle Theorems Mark Scheme		
1	$2x = 98°$ $x = 49°$	[1] Correct angle
	The angle at the centre is twice the angle at the circumference	[1]Correct reasoning
2	The angle opposite the diameter is a right-angle	[1] Correct reasoning
	$90° + 32° + x = 180°$ $122° + x = 180°$ $x = 180° - 122°$ $x = 58°$	[1]Correct angle
3	The angle opposite the diameter is a right-angle	[1] Correct reasoning
	Opposite angles in a cyclic quadrilateral add up to $180°$ $x = 90$	[1] Correct reasoning
4	AOC is an isosceles triangle. $O\hat{A}C = O\hat{C}A$ $O\hat{C}A = 22°$	[1] Correct angle
	OBC is an isosceles triangle. $O\hat{C}D = O\hat{A}D$ $67° = 22° + x$ $x = 67° - 22°$ $x = 45°$	[1] Correct angle
5	Tangents to a circle meet the radius at a right angle. $O\hat{B}C = O\hat{C}B = 90°$ $C\hat{O}D + 90° + 22° = 180°$ $C\hat{O}D + 112° = 180°$ $C\hat{O}D = 180° - 112°$ $C\hat{O}D = 68°$	[1] $C\hat{O}D = 68°$ gains the mark
	COD and AOD are similar triangles $C\hat{O}D = A\hat{O}D = 68°$	[1] Correct reasoning
	Angle at the origin $68° + 68° = 136°$	[1] Correct angle
	Angle at the circumference is half of the angle at the centre. $x = 136° \div 2$ $x = 68°$	[1] Correct angle

Turn over ►

6(a)	<u>Angle XBC</u> $X\hat{B}C + 110° + 23° = 180°$ $X\hat{B}C + 133° = 180°$ $X\hat{B}C = 180° - 133°$ $X\hat{B}C = 47°$	[1] Correct angle
6(b)	<u>Angle DAX</u> $X\hat{B}C = D\hat{A}X = 47°$	[1] Correct angle
	Angles in the same segment are equal.	[1] Correct reason
7	$D\hat{A}B = (2x + 28) \div 2$ $= x + 14$	[1] Logic of angle $D\hat{A}B$ given
	$D\hat{A}B + D\hat{C}B = 180°$ $x + 14 + 3x - 70 = 180°$	[1] Correct algebra equation set up
	$4x - 56 = 180$ $4x = 180 + 56$ $4x = 236$ $x = 59°$	[1] Calculation of x
8	OBC is an isosceles triangle. $O\hat{C}B = O\hat{B}C = 46$ $BOC = 180 - 46 - 46 = 88°$	[1] Correct angle with reason
	Angle at the circumference is half the angle at the centre $C\hat{A}B = BOC \div 2$ $= 88° \div 2$ $= 44°$	[1] Correct angle with reason
	ABC is an isosceles triangle. $A\hat{B}O = A\hat{C}O = 22°$ $as\ 44° + A\hat{B}O + 46° + 46° + A\hat{C}O = 180°$	[1] Correct angle with reason
	$OCE = 90°$	[1] Correct angle
	$DFC = 73°$ (Angles around a point) $ACD = 68°$ (Right angle $- A\hat{C}O$) Angles in a triangle add up to 180° $CDO = 180 - 73 - 68 = 39°$	[1] Final answer

END