Question	Scheme	Marks
3(a)	$\left(\frac{9}{2}, 0\right)$	B1
		(1)
(b)	$PS = 9$	B1
	$x_P = -\frac{9}{2} + 9 = \frac{9}{2} \Rightarrow OP = \sqrt{\left(\frac{9}{2}\right)^2 + \left(18 \times \frac{9}{2}\right)} = \ldots$	M1
	So perimeter = $"\frac{9}{2}"+"9"+"\frac{9\sqrt{5}}{2}"$	dM1
	$= \frac{27 + 9\sqrt{5}}{2}$ oe	A1
		(4)
		(5 marks)

Notes:

(a)

B1: Correct coordinates**.**

(b)

B1: Deduces $PS = 9$ from the focus directrix property (may be implied by seeing it embedded in an expression for the perimeter). May find coordinates of P first and then attempt Pythagoras theorem – must be correct. May be seen on the diagram. Allow even if incorrect value used later.

M1: Uses distance from directrix to find x coordinate of P and goes on to find OP by Pythagoras (with a plus sign).

dM1: Sums their **three** side lengths. Extras – including 0 – score M0. Depends on the previous M mark.

A1: Correct answer. Equivalents must be in simplified surd form.