Question	Answer	Marks	Guidance
9	$12\left(x^{\frac{2}{3}}\right)^2 - 11\left(x^{\frac{2}{3}}\right) - 5 = 0$	**B1**	For recognition of a 3-term quadratic equation in terms of $x^{\frac{2}{3}}$ or a suitable substitution
	$\left(3x^{\frac{2}{3}} + 1\right)\left(4x^{\frac{2}{3}} - 5\right) = 0$ $x^{\frac{2}{3}} = -\frac{1}{3},\ x^{\frac{2}{3}} = \frac{5}{4}$	**2**	**M1** for attempt to solve a 3-term quadratic equation in the form $12u^2 \pm 11u \pm 5 = 0$ to obtain at least one solution in the form $x^{\frac{2}{3}} = ...$ or 'u' = … **A1** for at least one correct solution.
	$x = 1.4$ only	**A1**	
10(a)	$27 = 12\theta$ $\theta = \frac{9}{4}$ oe	**B1**	$\angle AOB = \theta$
	Either $\tan(\pi - \theta) = \frac{CB}{12}$ soi Or $\frac{CB}{\sin(\pi - \theta)} = \frac{12}{\sin\left(\theta - \frac{\pi}{2}\right)}$	**M1**	Allow with *their* θ.
	Perimeter = $24 + 27 + 2(14.86..)$	**M1**	Allow with *their CB*.
	Perimeter = awrt 80.7	**A1**	From correct working only
10(b)	$\left(\frac{1}{2} \times 12^2 \times \textit{ their } \theta\right) + (12 \times \textit{ their } CB)$ 340 oe or 341 oe	**3**	**M1** for each area **A1** for awrt 340 or 341
11(a)	$\overrightarrow{AX} = \frac{\mathbf{b}}{2} - \mathbf{a}$	**B1**	Allow unsimplified
	$\overrightarrow{OZ} = \mathbf{a} + \lambda\left(\frac{\mathbf{b}}{2} - \mathbf{a}\right)$	**2**	**M1** for $\overrightarrow{OZ} = \mathbf{a} + \lambda \times their\left(\frac{\mathbf{b}}{2} - \mathbf{a}\right)$ Allow unsimplified Mark final answer
11(b)	$\overrightarrow{OY} = \frac{1}{2}(\mathbf{a} + \mathbf{b})$ oe	**B1**	Allow unsimplified
	$\overrightarrow{OZ} = \frac{\mu}{2}(\mathbf{a} + \mathbf{b})$	**B1**	**FT** on *their* $\overrightarrow{OY}$, allow unsimplified Mark final answer

Question	Answer	Marks	Guidance
11(c)	$\mathbf{a}+\lambda\left(\frac{\mathbf{b}}{2}-\mathbf{a}\right)=\frac{\mu}{2}(\mathbf{a}+\mathbf{b})$	**M1**	For equating *their* final answer for (a) and *their* final answer for (b) and attempt to equate like vectors at least once to obtain a scalar equation
	$\lambda=\mu=\frac{2}{3}$	**2**	**M1 dep** for solving *their* simultaneous equations to obtain at least one unknown. Each equation must be in terms of λ and μ **A1** for both.
11(d)	$\overrightarrow{OZ}=\frac{1}{3}(\mathbf{a}+\mathbf{b})$ oe	**B1**	Must be from correct work
12(a)	Cannot have the square root of a negative number. oe	**B1**	Must be a correct statement related to the question. Allow a numerical argument.
12(b)	$\frac{(x-3)\left(\frac{5}{2}\times(5x-2)^{-\frac{1}{2}}\right)-(5x-2)^{\frac{1}{2}}}{(x-3)^2}$ or $(x-3)^{-1}\frac{5}{2}(5x-2)^{-\frac{1}{2}}$ $+\left(-(x-3)^{-2}\right)(5x-2)^{\frac{1}{2}}$	**3**	**B1** for $\frac{5}{2}\times(5x-2)^{-\frac{1}{2}}$ seen **M1** for an attempt to differentiate a quotient or correct product **A1** for all other terms correct.
	$\frac{(5x-2)^{-\frac{1}{2}}}{2(x-3)^2}(5(x-3)-2(5x-2))$ oe	**M1**	**Dep** for an attempt to simplify to the given form, allow a sign error and an arithmetic error (e.g. Omission of a factor of 2 in the linear term).
	$\frac{-(5x+11)}{2(x-3)^2\sqrt{5x-2}}$ cao	**A1**	