Question Number	Scheme	Marks
1. (a)	Attempts gradient = $\frac{20--4}{-5-3}=(-3)$	M1
	Attempts equation of line $y-20="-3"(x+5)$ or $y+4="-3"(x-3)$	dM1
	$y=-3x+5$	A1
		(3)
(b)	Gradient $\frac{1}{3}$ or midpoint $\left(-1,8\right)$	B1ft
	$y-8=\frac{1}{3}(x+1)$	M1
	$x-3y+25=0$	A1
		(3)
		(6 marks)

(a)

M1: Attempts gradient = $\frac{\delta y}{\delta x}$ condoning slips. Look for an attempt at a difference in y coordinates over a difference in x coordinates. There is no requirement to simplify. They may use $20--4=m\left(-5-3\right)$ to find m.

dM1: Full method for equation of line using gradient and either point – as shown or may use $y="-3"x+c$ proceeding as far as finding c.

A1: $y=-3x+5$ The coefficients must be simplified, award A0 for $y=\frac{24}{-8}x+5$

Alt (a)

M1: Sets up two simultaneous equations using both points E.g $20=-5m+c$ and $-4=3m+c$ (allow one slip).

dM1: Solves the pair of simultaneous equations to find values for m and c (accept any values following two suitable equations having been set up).

A1: $y=-3x+5$

(b)

B1ft: Correct mid point or gradient, allowing follow through on the negative reciprocal of their gradient in (a)

M1: Attempts the perpendicular bisector (need not be a simplified form). Must be using ± the reciprocal of their gradient from (a) with a valid attempt at the midpoint – at least one correct coordinate (or calculation for) must be seen for the midpoint.

A1: $x-3y+25=0$ but allow any integer multiple and term in a different order (but must be on one side). Ignore if they give a label $l_2=x-3y+25=0$

Question Number	Scheme	Marks
2. (i)	$\dfrac{3y^3\left(2x^4\right)^3}{4x^2y^4}=\dfrac{6x^{10}}{y}$	B1, B1, B1 **(3)**
(ii)	$\dfrac{16}{\sqrt{3}+1}=a\sqrt{27}+4$	
	States or uses $\sqrt{27}=3\sqrt{3}$	B1
	Correct attempt at rationalising seen e.g. $\dfrac{16}{\sqrt{3}+1}\times\dfrac{\sqrt{3}-1}{\sqrt{3}-1}$	M1
	Correct attempt to make "a" the subject and make progress towards the form $p\sqrt{3}+q$ e.g. $8\sqrt{3}-8=3a\sqrt{3}+4\Rightarrow 3a\sqrt{3}=8\sqrt{3}-12\Rightarrow a=\dfrac{8\sqrt{3}}{3\sqrt{3}}-\dfrac{12}{3\sqrt{3}}$	M1
	$a=-\dfrac{4}{3}\sqrt{3}+\dfrac{8}{3}$	A1cso
		(4) **(7 marks)**

(i)

B1: For any one of 6, x^{10} or $\dfrac{1}{y}$ Allow y^{-1} for $\dfrac{1}{y}$ - may be seen separately, and allow for one correctly simplified term even if a spurious extra term in the same variable is present.

B1: For any two of the above as the only term in that variable within a single expression. E.g. $2x^{10}\times\dfrac{3}{y}$ is fine for B1B1 but $2x^{10}+\dfrac{3}{y}$ is B1B0.

B1: For $\dfrac{6x^{10}}{y}$ or $6x^{10}y^{-1}$ - must be one expression. Allow with y^1 in the denominator.

(ii)

B1: States or uses $\sqrt{27}=3\sqrt{3}$. May be implied by working as long as it is seen before the final answer.

M1: Correct attempt at rationalisation seen anywhere. This can be on any expression with a two term surd expression in a denominator during their working. The denominator may be simplified without the multiplication being seen (and need not be correct), but the evidence of the process must be clear.

M1: Attempts to make "a" the subject and make progress towards the form $p\sqrt{3}+q$ $\left(p,q\neq 0\right)$ - must reach a two term expression for a (but may be over common denominator), though the $\sqrt{27}$ may not have been simplified. E.g. accept for $a=\dfrac{8\sqrt{3}-12}{\sqrt{27}}$. Can be scored if a calculator was used to rationalise the surd expression but there must be an intermediate step before their final answer to show the method.