Way 3	If *AB* is diameter centre must be midpoint of *AB* ie $M\left(\frac{1+3}{2},\frac{0-10}{2}\right)$	**M1**
	$=(2,-5)$	**A1**
	$MA=\sqrt{(2-1)^2+(-5-0)^2}=\sqrt{26},\ MC=\sqrt{(2-7)^2+(-5-(-6))^2}=\sqrt{26}$	**dM1A1**
	$MA=\sqrt{26}, MC=\sqrt{26}$ so $MA=MC(=MB)$ As the length from *M* to each of *A* and *C* is the same *M* is the centre of the circle hence *AB* is a diameter. (Or equivalent)	**A1**
		(5)

M1: Attempts midpoint of *AB*. If no method is shown accept one correct coordinate as evidence.
A1: Correct midpoint
dM1: Attempts length of *MC* and at least one of *MA* or *MB*, or *AB*. *As M is midpoint of AB there is no need to find both MA and MB, these may be assumed to be the same.* If they find *AB* then they must halve it to find the radius.
A1: All required calculations correct for this approach.
A1: Suitable explanation made which may be in a preamble and conclusion given with no errors and all previous marks awarded.

The following approach is less common and should be marked as shown:

Way 4	If *AB* is diameter centre must be midpoint of *AB* ie $M\left(\frac{1+3}{2},\frac{0-10}{2}\right)$	**M1**
	$=(2,-5)$	**A1**
	$MA=r=\sqrt{(2-1)^2+(-5-0)^2}=\sqrt{26}$ $\Rightarrow (x-2)^2+(y+5)^2=26$ $C(7,-6)\Rightarrow (7-2)^2+(-6+5)^2=5^2+1^2=26$	**dM1A1**
	As *C* also satisfies the equation of the circle then *AB* must be the diameter (or equivalent) There must be some further justification as above rather than just "*AB* is a diameter" which may be in a preamble e.g. If *C* lies on the circle…	**A1**
		(5)

M1: Attempts midpoint of *AB*. If no method is shown accept one correct coordinate as evidence.
A1: Correct midpoint
dM1: Attempts length of *MA* or *MB* to find *r* or r^2, forms equation of the circle and substitutes the coordinates of *C*.
A1: All required calculations correct for this approach.
A1: Suitable explanation and conclusion given with no errors and all previous marks awarded.

SEE END OF MARKSCHEME FOR SOME OTHER MORE UNUSUAL METHODS THAT MAY BE SEEN DURING MARKING WITH SUGGESTED MARKING GUIDELINES.

There may be other methods. Choose the way that best fits the overall response.
If you are in any doubt if a particular response deserves credit then use Review.

Question	Scheme	Marks
4	$\log_4 a+\log_4 b=\log_4 ab$ or $\log_4 "ab"=3\Rightarrow "ab"=4^3$	**M1**
	$ab=K, a-b=8\Rightarrow a(a-8)=K$ or $(b+8)b=K$	**dM1**
	$a^2-8a-64=0$ or $b^2+8b-64=0$	**A1**
	$a=\frac{-(-8)+\sqrt{(-8)^2-4\times1\times-64}}{2\times1}=...$ or $b=\frac{-8+\sqrt{8^2-4\times1\times-64}}{2\times1}=...$	**M1**
	$a='4+4\sqrt{5}'\Rightarrow b=-4+4\sqrt{5}$	**M1**
	$a=4+4\sqrt{5}$ and $b=-4+4\sqrt{5}$ and no other solutions.	**A1**
		(6)
		(6 marks)

Notes:

M1: Correct addition law applied (may be implied) **or** undoes a log equation correctly, **or** replaces the 3 by $\log_4 4^3$ oe

The addition law may be seen after substitution from the first equation e.g.

$a-b=8\Rightarrow a=b+8\Rightarrow \log_4 a+\log_4 b=\log_4(b+8)+\log_4 b=\log_4 b(b+8)$

Condone $\log_4(b+8)+\log_4 b=\log_4 b^2+8b$

dM1: Removes logs correctly and proceeds from an equation of the form $ab=K$ and the given equation $a-b=8$ to a quadratic equation in either *a* or *b*.

A1: Correct quadratic equation. Brackets must be expanded but terms not necessarily all on one side. The " =0" may be implied by their attempt to solve.

M1: Solves a 3TQ in *a* or *b* to obtain a positive solution. There is no need to see the negative solution in their working.

M1: Uses their *a* to find *b* or vice versa. This depends on having solved a 3TQ earlier and obtained a root of the form $p+q\sqrt{r},\ p,q,r\neq0$ to obtain another root of a similar form i.e. not a decimal.

The value of *a* or *b* does not necessarily have to be positive for this mark.

Note that having found *a* or *b* they may repeat the process above to find the other value which is acceptable.

A1: Both of $a=4+4\sqrt{5}$ and $b=-4+4\sqrt{5}$ simplified, with no other solutions.

Apply isw once correct answers are seen, e.g. if they subsequently go into decimals.