Question	Answer	Marks	Guidance
2	$x^2+2x=kx-3$ $\left[\Rightarrow x^2+(2-k)x+3=0\right]$	**M1**	
	$(2-k)^2-12*0$	**M1**	**Dep** on previous **M** mark *Allow use of any inequality or equality
	$k^2-4k-8*0$	**A1**	
	$k=\frac{4\pm\sqrt{4^2+4\times8}}{2}$ oe	**M1**	Solve *their* 3-term quadratic equation in k
	$k=2\pm\sqrt{12}$ or $\frac{4\pm\sqrt{48}}{2}$ oe	**A1**	
	$k<2-2\sqrt{3}$, $k>2+2\sqrt{3}$ oe	**A1**	Allow $\sqrt{12}$ for $2\sqrt{3}$
3(a)	$\log_2 x-4=5\frac{\log_2 2}{\log_2 x}$ or $=\frac{1}{\log_2 x}$	**M1**	Correct use of change of base
	$(\log_2 x)^2-4\log_2 x-5=0$	**A1**	Arrange as 3-term quadratic equation in $\log_2 x$
	$(\log_2 x-5)(\log_2 x+1)=0$ or $\log_2 x=\frac{4\pm\sqrt{4^2-4\times(-5)}}{2}$	**M1**	**Dep** on previous **M** mark
	$\log_2 x=5$ or -1	**A1**	For either
	$x=32$ or $x=\frac{1}{2}$	**A1**	Both
	Alternative method		
	$\frac{\log_x x}{\log_x 2}-4=5\log_x 2$	**(M1)**	
	$(5\log_x 2)^2+4\log_x 2-1=0$	**(A1)**	
	$(5\log_x 2-1)(\log_x 2+1)=0$ or $\log_x 2=\frac{-4\pm\sqrt{4^2-4\times(-5)}}{10}$	**(M1)**	**Dep** on previous **M** mark
	$\log_x 2=\frac{1}{5}$ or -1	**(A1)**	For either
	$x=32$ or $x=\frac{1}{2}$	**(A1)**	Both

© Cambridge University Press & Assessment 2025