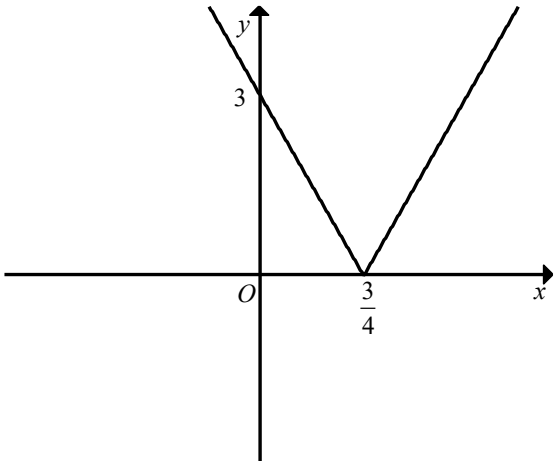
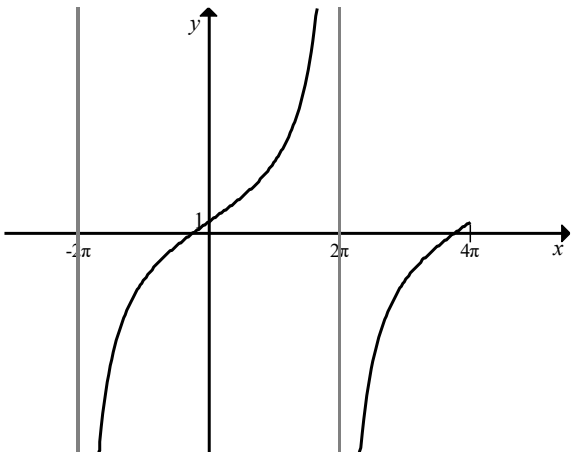
Question	Answer	Marks	Partial Marks
4(b)	$f^2(x) = 4x - 3$ soi	**B2**	**B1** for correct order of composition
	Correct sketch with both intercepts indicated 	**B2**	**FT** *their* $(4x - 3)$ providing B1 has been awarded and the expression is of the form $mx + c$ **B1 FT** for correct sketch with one intercept correct
4(c)	[When $x = -1$] $y = 7$ [When $x = 3$] $y = 9$	**B1**	**FT** *their* $(4x - 3)$ providing it has been formed using a correct order of composition and the expression is of the form $mx + c$
	$a = \frac{9-7}{3+1}$ oe or $7 = -a + b$ and $9 = 3a + b$ and solves correctly for one unknown	**M1**	**FT** *their* y-coordinates
	$a = \frac{1}{2}$, $b = \frac{15}{2}$	**A1**	
5(a)	4π	**B1**	
5(b)	Correct sketch with y-intercept and asymptotes marked 	**3**	**B1** for correct shape for both sections **B2** for asymptotes drawn at -2π, 2π and the y-intercept marked as 1; must have attempted correct shape or **B1** for any two of these; must have attempted correct shape or If 0 scored then **SC1** for correct graph between -2π and 2π with asymptotes marked at -2π, 2π and the y-intercept marked as 1

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Question	Answer	Marks	Partial Marks
6(a)	8400	**2**	**M1** for $5 \times 8 \times 7 \times 6 \times 5$ oe
6(b)(i)	3 628 800	**2**	**M1** for $7! \times 6!$
6(b)(ii)	1266	**2**	**M1** for ${}^{13}C_5 - {}^{7}C_5$
7(a)	–729 729	**2**	**B1** for ${}^{15}C_5 \left(x^2\right)^{10} \left(-\frac{3}{x^4}\right)^5$ oe
7(b)	$\frac{9(8)(7)}{6}a^3 = 7 \times \frac{9(8)}{2}a^2$ oe	**M2**	**M1** for $\frac{9(8)(7)}{6}a^3[x^3]$ oe or $\frac{9(8)}{2}a^2\left[x^2\right]$ oe
	$a = 3$ nfww	**A1**	
8(a)	$\frac{\mathrm{d}y}{\mathrm{d}x} = 3\mathrm{e}^{3x+2}\tan x + \mathrm{e}^{3x+2}\sec^2 x$	**3**	**B1** for $\frac{\mathrm{d}(\mathrm{e}^{3x+2})}{\mathrm{d}x} = 3\mathrm{e}^{3x+2}$ **M1** for correct structure of product rule **A1 FT** *their* $\frac{\mathrm{d}(\mathrm{e}^{3x+2})}{\mathrm{d}x} = 3\mathrm{e}^{3x+2}$ for all other components of product rule correct
	Correct small changes relationship e.g. $\frac{\delta y}{h} = \textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=0.1}$	**M1**	
	$13.1h$ or $13.07[68\ldots]h$	**A1**	**dep** on first three marks awarded
8(b)	$y:\ -\frac{1}{3}\cos(3x+\pi) + c$	**B2**	**B1** for $-\frac{1}{3}\cos(3x+\pi)$ or for $k\cos(3x+\pi) + c$ where k is $\frac{1}{3}$ or $k < 0$
	$\frac{4}{3} = -\frac{1}{3}\cos\left(\frac{3\pi}{9}+\pi\right) + c$	**M1**	**FT** *their k* providing **B1** has been awarded
	$\left[y = -\frac{1}{3}\cos\left(\frac{5\pi}{4}+\pi\right) + \frac{7}{6} =\right]\ \ \frac{7-\sqrt{2}}{6}$ or exact equivalent	**A1**	
9(a)	$n = 31$ OR $n = \frac{150+d}{d}$	**2**	**M1** for $\frac{n}{2}\{9+159\} = 2604$ oe OR **M1** for $159 = 9 + d(n-1)$ oe