

Name: _____

S.r# _____

Q1) for each part, find a formula for a **rational** function f that satisfies the conditions.

#	Conditions			The formula
i.	$\lim_{x \rightarrow 4^+} f_1 = -\infty$	$\lim_{x \rightarrow 4^-} f_1 = +\infty$	$y = 1$ is a H.A	$f_1 =$
ii.	$f_2(3) = 0$	$\lim_{x \rightarrow 1} f_2 = 2$	$f_2(1)$ is undefined	$f_2 =$
iii.	$\lim_{x \rightarrow 0} f_3 = -\infty$	$f_3(-1) = 0$	$y = 1$ is a H.A	$f_3 =$

Q2) If $f(x) = x^2 + \sin x$, prove that there exist c such that $f(c) = 10$?

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Q3) Find the **equation(s)** of the asymptotes (if any) for:

i. $f(x) = \frac{\sqrt{4x^2+3}}{x+1}$

ii. $f(x) = \tan^{-1} \left(\frac{e^{-x}}{1-e^{-x}} \right)$

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