Math SL 1 CLASSWORK March 26 name: _____

EXERCISE 14A

1 Evaluate:

a $\lim_{x \to 3} (x + 4)$ **b** $\lim_{x \to -1} (5 - 2x)$ **c** $\lim_{x \to 4} (3x - 1)$

d $\lim_{x \to 2} (5x^2 - 3x + 2)$ **e** $\lim_{h \to 0} h^2(1 - h)$ **f** $\lim_{x \to 0} (x^2 + 5)$

2 Evaluate:

a $\lim_{x \to 0} 5$ **b** $\lim_{h \to 2} 7$ **c** $\lim_{x \to 0} c$, c a constant

3 Evaluate:

a $\lim_{x \to 1} \dfrac{x^2 - 3x}{x}$ **b** $\lim_{h \to 2} \dfrac{h^2 + 5h}{h}$ **c** $\lim_{x \to 0} \dfrac{x - 1}{x + 1}$ **d** $\lim_{x \to 0} \dfrac{x}{x}$

4 Evaluate the following limits:

a $\lim_{x \to 0} \dfrac{x^2 - 3x}{x}$ **b** $\lim_{x \to 0} \dfrac{x^2 + 5x}{x}$ **c** $\lim_{x \to 0} \dfrac{2x^2 - x}{x}$

d $\lim_{h \to 0} \dfrac{2h^2 + 6h}{h}$ **e** $\lim_{h \to 0} \dfrac{3h^2 - 4h}{h}$ **f** $\lim_{h \to 0} \dfrac{h^3 - 8h}{h}$

g $\lim_{x \to 1} \dfrac{x^2 - x}{x - 1}$ **h** $\lim_{x \to 2} \dfrac{x^2 - 2x}{x - 2}$ **i** $\lim_{x \to 3} \dfrac{x^2 - x - 6}{x - 3}$

EXERCISE 14B

1 For each of the following functions:

i discuss the behaviour near the asymptotes and hence deduce their equations

ii state the values of $\lim_{x \to -\infty} f(x)$ and $\lim_{x \to \infty} f(x)$.

a $f(x) = \dfrac{1}{x}$ **b** $f(x) = \dfrac{3x - 2}{x + 3}$ **c** $f(x) = \dfrac{1 - 2x}{3x + 2}$

d $f(x) = \dfrac{x}{1 - x}$ **e** $f(x) = \dfrac{x^2 - 1}{x^2 + 1}$ **f** $f(x) = \dfrac{x}{x^2 + 1}$

2 **a** Sketch the graph of $y = e^x - 6$.

b Hence discuss the value and geometric interpretation of:

i $\lim_{x \to -\infty} (e^x - 6)$ **ii** $\lim_{x \to \infty} (e^x - 6)$

3 Find, if possible, $\lim_{x \to -\infty} (2e^{-x} - 3)$ and $\lim_{x \to \infty} (2e^{-x} - 3)$.