Practice Mid term 1

1) Check notes for week 1

a) $\frac{1}{3}$

b) $\frac{1}{7}$

c) $\frac{5}{6}$

d) $\frac{x-5}{x-3}$

2) a) Since $2 \geq 1$, $\lim_{x \to 2} f(x)$ exists

$$\lim_{x \to 2} f(x) = 2(2) - 1 = 3$$

b) $\lim_{x \to 1+} f(x) = 2(1) - 1 = 1$

c) $\lim_{x \to 1-} f(x) = 3(1) = 3$

d) Since $\lim_{x \to 1+} f(x) \neq \lim_{x \to 1-} f(x)$

So $\lim_{x \to 1} f(x)$ does not exist

3). $Q(t) = 0.48\left(\frac{1}{2}\right)^t$

Now $Q(t) = 0.03$

$\therefore 0.03 = 0.48\left(\frac{1}{2}\right)^t$

$\left(\frac{1}{2}\right)^4 = 0.0625 = \left(\frac{1}{2}\right)^t$

$\Rightarrow t = 4$

4) (ii) $g(1) = 0$

(iii) tells you slope at $x=1$ is 3 i.e. $g'(1) = 3$

(A) $g(1) = 0$ but $g'(1) = 0 \neq 3$

(B) $g(1) \neq 0$

(C) $g(1) = 0$ but $g'(1) = -3 \neq 3$

(D) $g(1) = 0$ AND $g'(1) = 3$

$\therefore$ Ans = D