

Linköpings universitet  
Matematiska institutionen

**Matematisk analys, 764G07 Provkod KTR2.**  
**Dugga 2.**  
**2020-10-09 kl 14.00-17.00**

1. (a)  $]\frac{1}{2}, \frac{3}{2}]$ .  
(b)  $x = 0, x = 1$ .  
(c)  $]\frac{3}{4}\pi, \pi[ \cup ]\frac{7}{4}\pi, 2\pi[$ .
2. (a)  $\frac{2}{3}$ .  
(b)  $\frac{5}{2}$ .  
(c)  $\frac{3}{2}$ .
3. (a)  $f'(x) = e^{3x}(3 \sin(2x) + 2 \cos(2x))$ .  
(b)  $f'(x) = -\frac{2 \cos(3x)(3(x+1) \sin(3x) + \cos(3x))}{(x+1)^3}$ .  
(c)  $f'(x) = \lim_{h \rightarrow 0} \frac{3(x+h) - (x+h)^2 - 3x + x^2}{h} = 3 - 2x$ .
4. (a)  $a = \frac{1}{4}$ .