



# Sample exam 2

*Version Preparatory course in mathematics*

**SF0003 Introductory Course in Mathematics**  
**August 2017**

Duration: 60 minutes

Allowed aids: None

Examinator: Tommy Ekola

The exam consists of six questions each worth at most two points. A total of seven points or more will give a pass grade.

1. Simplify  $\frac{\frac{1}{3} - \frac{2}{7}}{\frac{4}{9} - \frac{1}{3}}$  by writing over a common denominator. The result should be reduced as far as possible.
2. Simplify  $\frac{3}{x} - \frac{7}{x+1} + \frac{4x-1}{x^2+x}$  by writing over a common denominator. The result should be reduced as far as possible.
3. Complete the square to determine the smallest value obtained by the polynomial  $x^2 + 3x + 4$ .
4. Simplify  $\ln 81 - \ln 9 - \ln 3$ .
5. Determine the equation for the circle which has centre  $(-1, 2)$  and contains the point  $(2, 6)$ .
6. Suppose that  $-\frac{\pi}{2} \leq v \leq \frac{\pi}{2}$  and that  $\sin v = a$ . Express  $\sin\left(\frac{\pi}{2} - v\right)$  in terms of  $a$ .