

# P101 Coursework 1

Name:

Fill in the final answer in the boxes on this sheet. Make sure that you attach this page, containing your **name**, as well as your final answers, to the work you hand in. Please staple all pages together and do not use red ink. Please return this assessment before Tuesday 22 October 2002, 10 am, in the departmental office, room H15.

1. Solve the following equations for  $x$

(i)  $\frac{x-2}{x+1} + x = 1$ ,

(ii)  $\frac{1}{\sqrt{1+x^2y}} = 2$ ,

(iii)  $x^3 + 7x^2 + 14x + 8 = 0$ ,

(iv)  $\ln y = 3 + 2 \ln x$ ,

(v)  $10^x = 0.01$ ,

Solve the following equations for  $x$  and  $y$ :

(vi)  $\begin{cases} 2x + 5y = 10 \\ 3x - 3y = 2 \end{cases}$ ,

(vii)  $\begin{cases} x^2 + 3y = 10 \\ 4x - y = 1 \end{cases}$ ,

2. Simplify and, if possible, find values of the following (without using a calculator!)

(i)  $2^3 \cdot 3 \cdot 4^{-2} \cdot 5^2$ ,

(ii)  $((2^4)^{1/2})^{-2}$ ,

(iii)  $1000^{\log_2(1/8)}$ ,

(iv)  $\log_3(81)$ ,

3. Evaluate the following **without the use of a calculator!!**

(i)  $\cos(5\pi/6)$ ,

(ii)  $\tan(\frac{7\pi}{12})$ ,

(iii)  $\cos(3\pi)$ ,

(iv)  $\cot((n+1/2)\pi)$ ,   
( $n$  integer)

(v)  $\cos^{-1}(1/2)$ ,

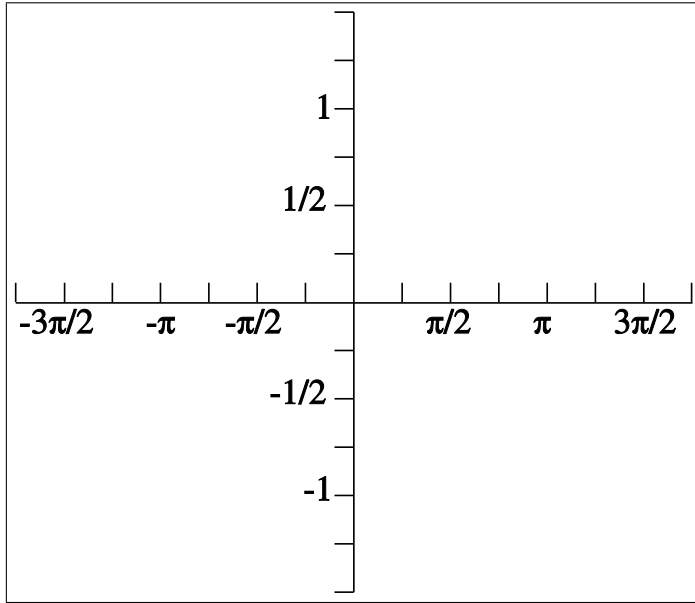
(vi)  $\tan^{-1}(1)$ ,

(vii)  $\sin^{-1}(1/2)$ ,

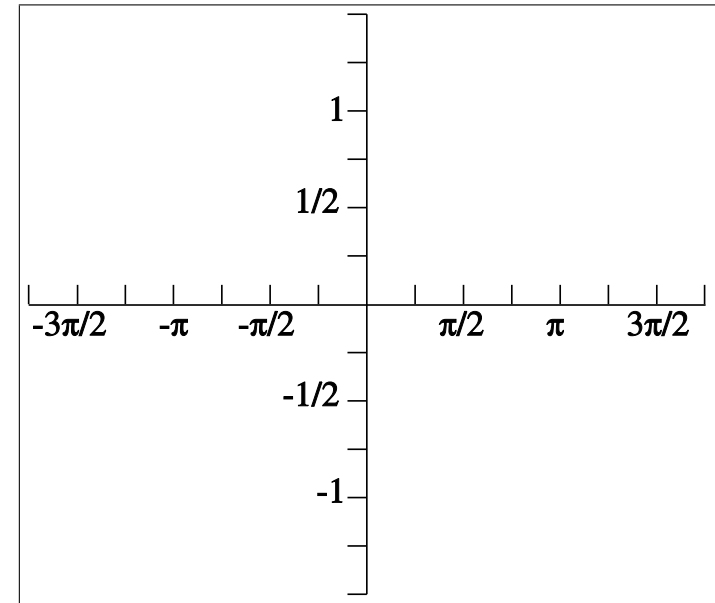
4. Determine the polar coordinates of the point  $(4, -3)$ .

5. Sketch graphs of

(i)  $(x + 2)(x - 1)(x - 2)/(x + 1)$

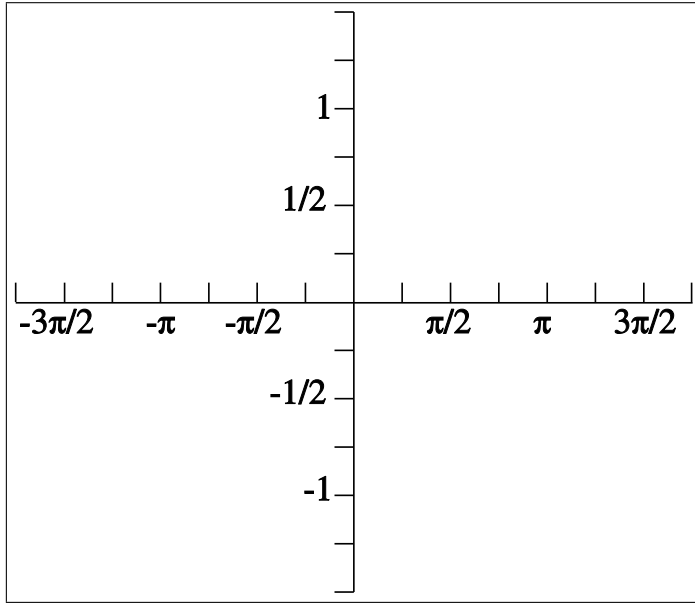


(ii)  $\cot(4x - \pi/3)$



6. Sketch graphs of the functions (in polar coordinates). Don't forget to specify the allowable range for  $\theta$ !

(i)  $r = \sin(\theta + \pi/4)$



(ii)  $\frac{1}{1 - 2 \sin(\theta)}$

