Exam 2, section 011

1. A cartesian equation involves x, y only. A polar equation involves only r, θ (standing for algebraic radius and angle). To transform one into the other requires only substitution in one case (which?), or elimination in the other. See also CC11.

5. $\left|e^x - 1\right|$ and $e^x - 1$ are not the same function. To convince yourself, plot each. (Sketch, do not tabulate). In general, the plot of the function $g(x) = \left|f(x)\right|$ is obtained by recognising the intervals where $f(x)$ is positive or negative. Where $f(x) < 0$, there holds $g(x) = -f(x)$, so that the graph of g is obtained by flipping the graph of f about the x-axis.

Exam 2, section 040

2. Arcs of curves are described not only by equations, but also by suitable intervals. This must be reflected in your answer, even after eliminating the parameter t.
   A sketch is not a rigorous plot. When asked to sketch basic curves (parabolæ, hyperbolæ), do not tabulate. Tabulating is time-consuming, and gives a clumsy impression. Rather, recognise the main features of the curve: vertex and axis of symmetry for a parabola, asymptotes and position of the branches for a hyperbola.

3. The loop fails both vertical and horizontal line tests. So you can neither regard y a function of x, nor x a function of y.

6. In part (a), $y \geq 0$ should read $x \geq 0$.

Exam 3, section 011

1. To sketch the region, find the intercepts of $y(x)$ with the x-axis, and by setting $y' = 0$, the location of the maximum. y' also gives the slopes at $x = 0$ and $x = 1$. Do not tabulate.

2.

   (a) This is an arc of a standard curve. Does $(1, 0)$ belong to the curve?

   (b) The parametrization involves not only equations of x, y in terms of the parameter, but also the suitable interval for the parameter. The given curve is half of a parabola.

3. This is problem 7 of your quiz. You need not compute the integral exactly, which may not be possible, but use comparison instead. Refer to the solution shown in class.

5. For (a), if you are using a theorem, state exactly what it says.

6. In part (b), $\sum_{n\geq 1} \ln(x)^n$ should read $\sum_{n\geq 1} (\ln x)^n$.

Exam 3, section 040

1. See comment on problem 1 of exam 2, section 011.