1. Use the Quotient Rule to determine the equation of the derivatives of the following functions:

   a. $y = \frac{x^2}{x+1}$ b. $y = \frac{6x}{x^3 - 2}$ c. $y = \frac{e^{3x}}{x-3}$ d. $y = \frac{sin(x)}{x}$ e. $y = \frac{ln(x)}{x^2}$

Here are a couple of videos going through more worked examples

(1) https://www.youtube.com/watch?v=K3MxofAF-9o
(2) https://www.youtube.com/watch?v=PkdYCDA0CWU

2. (CI) Determine the gradient of the curve $y = \frac{x^2 - 4}{x^2 - 1}$ at the point(s) where the curve crosses the *x*-axis. Confirm your answer using the TI-84 calculator.

3. (CI) Determine the equation of the line normal to $y = \frac{x}{sin(x)}$ at the point where x = $\frac{\pi}{2}$. Confirm your answer using the TI-84 calculator.

4. (CI) For the curve defined by $y = \frac{x}{x^2 + 1}$,

   a. find the equation of the normal at the original
   b. the equations of the tangents that are parallel to the *x*-axis.
   c. Hence, find the points where the tangents and normal intersect.
   d. Confirm your work on the TI-84

5. (CI) For the function $f(x) = \frac{cos(x)}{e^x}$ on the domain of $[0, \frac{5\pi}{2}]$, find:

   a. the *x*-intercepts;
   b. the coordinates of the first 2 stationary points;
   c. the intervals of increase/decrease.
   d. Hence, sketch the curve. Verify with your calculator.

6. (CI) Sketch the curve of the function $y = \frac{(1+x)^2}{e^x}$, identifying (if they exist) all stationary points and points of inflection.

7. Further Practice ⇒ http://www.mathcentre.ac.uk/resources/uploaded/mc-ty-quotient-2009-1.pdf