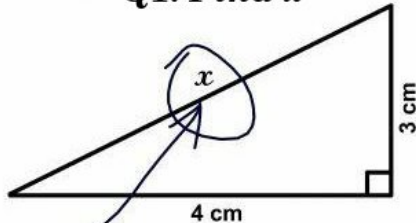


MA211  
Lecture 12: Class Test

Wed 16 October 2008

**Q1. Find  $x$**



*Here it is*

**Q1.** Using that  $\cosh(x) = \frac{1}{2}(e^{-x} + e^x)$  and  $\sinh(x) = \frac{1}{2}(e^{-x} - e^x)$  to show that

$$\cosh^2 x - \sinh^2 x = 1.$$

.....

**Q2.** Write down the general solution to the following differential equations:

(i)  $25y'' - 20y' + 4y = 0.$

(ii)  $y'' + y' - 12y = 0$

.....

**Q3.** Find values of  $b$  and  $c$  such that  $y(x) = \cosh(2x)$  is a solution to the differential equation:

$$y'' + by' + cy = 0.$$

# Solutions

## Q1

Using that  $\cosh(x) = \frac{1}{2}(e^{-x} + e^x)$  and  $\sinh(x) = \frac{1}{2}(e^{-x} - e^x)$  to show that

$$\cosh^2 x - \sinh^2 x = 1.$$

## Q2 (i)

Write down the general solution to the following differential equation:

$$25y'' - 20y' + 4y = 0.$$

## Q2 (ii)

Write down the general solution to the following differential equation:

$$y'' + y' - 12y = 0$$

# Solutions

## Q3

Find values of  $b$  and  $c$  such that  $y(x) = \cosh(2x)$  is a solution to the differential equation:

$$y'' + by' + cy = 0.$$