

Quiz 5, 10 October 2008

1. What is the date and time of the second exam?

*Solution:* 22 October 2008, 7:30pm-9:30pm

2. Find all solutions to the system

$$x^2 + y^2 = 5, \quad x + y = 3$$

*Solution:* We solve  $x + y = 3$  for  $y$  and obtain  $y = 3 - x$ . We substitute  $x - 3$  for  $y$  in the equation  $x^2 + y^2 = 5$  and obtain

$$x^2 + (3 - x)^2 = 5.$$

Expanding the square gives

$$x^2 + 9 - 6x + x^2 = 5.$$

Simplifying leads to

$$2x^2 - 6x + 4 = 0.$$

Take out the common factor and factor gives

$$2(x^2 - 3x + 2) = 2(x - 2)(x - 1) = 0.$$

The solutions are  $x = 2$  or  $x = 1$ . Compute the values of  $y$  using the equation  $y = 3 - x$  and check your answers. The solutions are:

$$(x, y) = (2, 1), \quad (x, y) = (1, 2)$$

3. If  $f(x) = x^2 + 2x$ . Simplify

$$f(a + 2) - f(a).$$

*Solution:*

$$\begin{aligned} f(a + 2) - f(a) &= (a + 2)^2 + 2(a + 2) - (a^2 + 2a) \\ &= a^2 + 4a + 4 + 2a + 4 - a^2 - 2a \\ &= 4a + 8 \end{aligned}$$