7 The point C with coordinates (2, 1) is the centre of a circle which passes through the point A with coordinates (3, 3).

(a) Find the radius of the circle.

(2)

The line AB is a diameter of the circle.

(b) Find the coordinates of B.

(2)

The points D with coordinates (0, 2) and E with coordinates (4, 0) lie on the circle.

(c) Show that DE is a diameter of the circle.

(2)

The point P has coordinates (x, y).

(d) Find an expression, in terms of x and y, for the length of CP.

(2)

Given that the point P lies on the circle,

(e) show that $x^2 + y^2 - 4x - 2y = 0$

(2)

Question 7 continued

Question 7 continued

Question 7 continued

(Total for Question 7 is 10 marks)