1 (a) Solve the inequality

$$x^2 + 8x > 20$$

(3)

(b) Find the set of values for x which satisfy both of the inequalities

$$x^2 + 8x > 20$$

$$18 + 3x < 23 + x$$

(1)

(Total for question 1 is 4 marks)

2 Find the set of values of x for which

$$(x + 5)(x + 1) < 32$$

(Total for question 2 is 4 marks)

---

3 Solve the simultaneous equations

$$x + y = 3$$
$$x^2 + 2y^2 - 8x = 6$$

(Total for question 3 is 4 marks)

---

4 Solve the inequality

$$x(x+1) \leq 12$$

(Total for question 4 is 3 marks)

---

5 Find the coordinates of the points where the circle C with equation $x^2 + y^2 - 2x = 19$ meets the line L with equation $y = 3x - 1$

(Total for question 5 is 4 marks)

---

6 The curve C has the equation $y = x^2 - 2x + 7$ The line L has the equation $x + y = 7$ Find the coordinates of the points where L and C intersect.

(Total for question 6 is 4 marks)

7 Solve the simultaneous equations

$$x + 2y = 3$$
$$x^2 + y^2 - 2xy = 6$$

(Total for question 7 is 7 marks)

8 (a) Solve the inequality

$$x^2 + 3x - 10 < 0$$

(3)

(b) Find the set of values for x which satisfy both of the inequalities

$$x^2 + 3x - 10 < 0$$
$$9 + 3x \leq 12 + x$$

(2)

(Total for question 8 is 5 marks)

9 Using algebra, solve the inequality $x^2 - 2x > 15$ writing your answer in set notation.

(Total for question 9 is 3 marks)

---

10 Solve the inequality $x^2 - 3x > 18$

(Total for question 10 is 2 marks)

---

11 Using algebra, solve the inequality $x^2 - x - 12 < 0$ writing your answer in set notation.

(Total for question 11 is 3 marks)

---

12 Determine the points of intersection of the curve $2xy + x^2 - 32 = 0$ and the line $x + 3y = 2$

(Total for question 12 is 5 marks)

---

13 Solve the inequality $18 - x < 5x - 2$

(Total for question 13 is 2 marks)

---

14 The curve with equation $y = px^2 - 4px - 5p$, where p is a constant does not intersect the line with equation $y = 2x - 12$.

(a) Show that $9p^2 - 8p + 1 < 0$

(4)

(b) Find the set of possible values for p.

(4)

(Total for question 14 is 8 marks)

15 Using algebra, solve the inequality $15 - 2x^2 > 7x$ writing your answer in set notation.

(Total for question 15 is 3 marks)