

Question 1:

A circle has equation $x^2 + y^2 = z$

- A. Find the centre of the circle (1 mark)
- B. Find the equation of the tangent to the circle at the point $(-4, 2)$ (4 marks)
- C. Calculate the value of z (1 mark)

Question 2: (4 marks)

Solve the simultaneous equations:

$$y^2 = x$$

$$y = 4 - 3x$$

Question 3: (5 marks)

You are given 2 odd integers with a difference of 4.

Prove that the difference between the squares of the integers is 8 times the mean of the integers.

Question 4: (4 marks)

Simplify the fraction $\frac{(x^2 + 2x - 15)(2x + 4)}{(x^2 - 4)(x^2 - 7x + 12)}$ in the form $\frac{a(x + b)}{(x + c)(x + d)}$ where a,b,c and d are integers to be found

Question 5: (4 marks)

$$(x + 1)(x + 2y + 1) = (2n + 2)^2$$

Where n is a positive integer and y is a positive integer.

Use this statement to prove that x is odd.