Answer on Question # 70247 - Math - Calculus

Question

x − y + 2 = 0 is a tangent to the curve 3 2 (x + y) = (x − y + 2) at (−1, 1) is it true or false.justify the answer

Solution

The equation written as

3 2 (x + y) = (x − y + 2)

is not an equation of a curve, but is an equation of the line which also can be written in the form

$$32x + 32y = x - y + 2$$

or

$$31x + 33y - 2 = 0$$

The word tangent is derived from the Latin word tangens, which means "touching." Thus

a tangent to a curve is a line that touches the curve. So the tangent can only be to a curve but not to a line and we can say that the original statement is false.

Note also that the point (−1, 1) is common to both lines

$$x - y + 2 = 0 \text{ and } 31x + 33y - 2 = 0$$

in which they intersect (but not touch). Indeed substituting (−1, 1) into these equations we get

$$-1 - 1 + 2 = 0 \text{ and } -31 + 33 - 2 = 0$$

so that the point (−1, 1) belongs to both lines.

Answer: statement is false.