SOLUTION

a curve has equation y=3x^2 -14x+5. the point q lies on the curve and the tangent at q is parallel to the line with equation y=x-42. find the x coordinate of q

Let them $l_1 : y = k_1 x + b_1$

$l_2 : y = k_2 x + b_2$

Lies $l_1 \,||\, l_2 \Leftrightarrow k_1 = k_2$

If $y = kx + b$ is a tangent to y=3x^2 -14x+5 in q then $y = kx + b \,||\, y = 1 * x - 42 \Rightarrow k = 1$

$y' = \left(3x^2 - 14x + 5\right)' = 6x - 14$

The equation of the tangent to the curve at the point looks like:

$y = f'(q)x + (f(q) - f'(q)q)$

$y = kx + b$

$\Rightarrow y = k = 1$

$y' = 6x - 14 = 1$

$6x = 15 \Rightarrow x = 2.5$

ANSVER

The x coordinate of q is 2.5