Name: _____ 5-a-day Further Maths

4th April

Corbettmaths

Give that

$6x^3 - 5x^2 + 10 \equiv A(x-1)^3 + 2x^3 + Bx^2 + Cx + D$

Find the values of A, B, C and D

$6 = A + 2$ $\boxed{A = 4}$

$-5 = B - 3A$

$-5 = B - 12$ $\boxed{B = 7}$

$C + 3A = 0$ $\boxed{C = -12}$

$C + 12 = 0$

$D - A = 10$ $\boxed{D = 14}$

$(x^2 - 2x + 1)(x - 1)$

$x^3 - x^2 - 2x^2 + 2x + x - 1$

$x^3 - 3x^2 + 3x - 1$

$A(x^3 - 3x^2 + 3x - 1) + 2x^3 + Bx^2 + Cx + D$

$(A+2)x^3 + (B - 3A)x^2 + (C + 3A)x + (D - A)$

A straight line has equation

$8x - 5y + 25 = 0$

A point that has coordinates $(q, q+1)$ lies on the line

Calculate the value of q

$8q - 5(q+1) + 25 = 0$

$3q + 20 = 0$

$3q = -20$

$q = -\frac{20}{3}$

Solve the simultaneous equations

$2x + 3y + z = 41$ — (1)

$3x + 2y + z = 40$ — (2)

$x + 2y + 3z = 44$ — (3)

(2) − (1)

$x - y = -1$

3 × (1) $6x + 9y + 3z = 123$ — (4)

(4) − (3) $5x + 7y = 79$

$7x - 7y = -7$

add $5x + 7y = 79$

$12x = 72$

$\boxed{x = 6}$

$\boxed{y = 7}$

Sub $x = 6$, $y = 7$ into (3)

$6 + 14 + 3z = 44$

$3z = 24$

$\boxed{z = 8}$