Exercise 2J

Question 1:
$x^3 + 27$
$= x^3 + 3^3$
$= (x + 3)(x^2 - 3x + 9)$
Since $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Question 2:
$8x^3 + 27y^3$
$= (2x)^3 + (3y)^3$
$= (2x+ 3y)[(2x)^2 - (2x)(3y) + (3y)^2]$
Since $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
$= (2x + 3y)(4x^2 - 6xy + 9y^2)$.

Question 3:
$343 + 125\ b^3$
$= (7)^3 + (5b)^3$
$= (7 + 5b)[(7)^2 - (7)(5b) + (5b)^2]$
Since $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
$= (7 + 5b)(49 - 35b + 25b^2)$

Question 4:
$1 + 64x^3$
$= (1)^3 + (4x)^3$
$= (1 + 4x)[(1)^2 - 1(4x) + (4x)^2]$
Since $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
$= (1 + 4x)(1 - 4x + 16x^2)$.

********** END **********