**1** (a) Simplify $(x^3)^5$

brackets means multiply indices

$(x^3)^5 = x^{3\times5} = x^{15}$

$x^{15}$ (1)

**(1)**

(b) Expand and simplify $4(x + 3) + 7(4 - 2x)$

$4(x+3) + 7(4-2x)$ distribute to all terms in the bracket (1)

$4x + 12 + 28 - 14x$

collect like terms

$40 - 10x$ (1)

$40 - 10x$

**(2)**

(c) Factorise fully $15x^3 + 3x^2y$

find all common factors:
both terms are multiples of $3x^2$

$3x^2(_ + _)$ (1) Find what remains after $3x^2$ has been taken out of each term.

$3x^2(5x + y)$ (1)

$3x^2(5x+y)$

**(2)**

**(Total for Question 1 is 5 marks)**

**2** Work out the value of $\dfrac{4^{-6} \times 4^{9}}{4}$

same base number
so use indice laws

$4^{-6} \times 4^{9}$, add powers $\Rightarrow$ $4^{3}$ ✓ (1)

$4^{3} \div 4^{1}$, subtract powers $\Rightarrow$ $4^{2} = 16$

16 ✓ (1)

**(Total for Question 2 is 2 marks)**

**3** (a) Simplify $m \times m \times m \times m$

$a \times a = a^2$

$a \times a \times a = a^{(1+1+1)} = a^3$

$m \times m \times m \times m = m^{(1+1+1+1)}$

$= m^4$

$m^4$ (1)

**(1)**

**(Total for Question 3 is 1 mark)**