Exercise 9A p 141

2b. $(2p+3q_n)^3$

$= 1.(2p)^3(3q_n)^0 + 3(2p)^2(3q_n)^1 + 3(2p)(3q_n)^2 + 1(2p)^0(3q_n)^3$

$= 8p^3 + 36p^2q_n + 54pq_n^2 + 27q_n^3$

3b. $(2x+5)^3$

$= 1(2x)^3(5)^0 + 3(2x)^2(5)^1 + 3(2x)(5)^2 + 1(2x)^0(5)^3$

$= 8x^3 + 60x^2 + 150x + 125$

Coeff of $x = 150$

4.b. $(1-3x)^4$

$= 1 + 4(-3x) + 6(-3x)^2 + 4(-3x)^3 + (-3x)^4$

$= 1 - 12x + 54x^2 - 108x^3 + 81x^4$

Coeff of $x^2 = 54$

5c. $(2m-3n)^4$

$= (2m)^4 + 4(2m)^3(-3n) + 6(2m)^2(-3n)^2 + 4(2m)(-3n)^3 + (-3n)^4$

$= 16m^4 - 96m^3n + 216m^2n^2 - 216mn^3 + 81n^4$

6b. $(2-5x)^4$

$= (2)^4 + 4(2)^3(-5x) + 6(2)^2(-5x)^2 + 4(2)(-5x)^3 + (2)^0(-5x)^4$

$= 16 - 160x + 600x^2 - 1000x^3 + 625x^4$

Coeff of $x^3 = -1000$

7. $(1+x+2x^2)^2 = [(1+x)+2x^2]^2$

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

$= (1+2x+x^2) + 2(2x^2+2x^3) + 4x^4$

$= 1+2x+5x^2+4x^3+4x^4$

Check: $x = 1$

$(1+1+2)^2 = 16$

$= 1+2+5+4+4 = 16$

10 $(1+ax)^4$ $\qquad 1372x^3$

$= (1)(ax)^0 + 4.(1)(ax) + 6.(1)(ax)^2 + 4(1)(ax)^3 + 1(1)(ax)^4$

$4a^3x^3 = 1372x^3$

$4a^3 = 1372$

$a^3 = 343$

$a = \underline{7}$