Marked example 3

Paper 2 style · Graphic display calculator

3 5 marks SL 1.9 ●●● Demanding

Consider the expansion of $\left(x^2 + \frac{2}{x}\right)^6$.

(a) Write down the general term, simplifying the power of x. **[2]**

(b) Find the constant term. **[2]**

(c) Find the coefficient of x^3. **[1]**

MARKSCHEME (a)

$\binom{6}{r}\left(x^2\right)^{6-r}\left(\frac{2}{x}\right)^r$ **(M1)**

$= \binom{6}{r}2^r x^{12-3r}$ **A1**

Total 2 marks

MARKSCHEME (b)

$12 - 3r = 0,\ r = 4$ **(M1)**

$\binom{6}{4} \times 2^4 = 240$ **A1**

Total 2 marks

MARKSCHEME (c)

$r = 3$: $\binom{6}{3} \times 2^3 = 160$ **A1**

Total 1 mark

Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software.
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