

$$(a + 2x)^3(4 - x)^4 \equiv 6912 + bx + \dots$$

Find a and b

The expansion for $(a + 2x)^3 \equiv a^3 + 3 \times a^2 \times (2x) + \dots$
 $\equiv a^3 + 6a^2x + \dots$

The expansion for $(4 - x)^4 \equiv 4^4 + 4 \times 4^3 \times (-x) + \dots$
 $\equiv 256 - 256x + \dots$

$$(a + 2x)^3(4 - x)^4 \equiv (a^3 + 6a^2x + \dots)(256 - 256x + \dots)$$

$$6912 + bx + \dots \equiv (a^3 + 6a^2x + \dots)(256 - 256x + \dots)$$

$$6912 = 256a^3$$

$$\frac{6912}{256} = a^3$$

$$27 = a^3$$

$$27 = a^3$$

$$a = 3$$

$$bx = a^3 \times (-256x) + 6a^2x \times 256$$

$$bx = -256a^3x + 1536a^2x$$

$$bx = -256 \times 3^3x + 1536 \times 3^2x$$

$$bx = -256 \times 3^3x + 1536 \times 3^2x$$

$$b = 6912$$