

**YOU & MATHS** What is missing? Write the binomial that is missing.

a.  $(\quad)^2 = 14a^2 + a^4 + 49$

b.  $(\quad)^2 = x^{10} - 6x^5 + 9$

c.  $(\quad)^2 = \frac{1}{64} + y^8 - \frac{1}{4}y^4$

Recall that  $(a + b)^2 = a^2 + 2ab + b^2$  and that  $(a - b)^2 = a^2 - 2ab + b^2$ .

Identify two squares in the trinomials on the right hand side of the equations and check that the remaining term is plus or minus twice the product of the bases of these squares. In that case you have found the terms of the binomial you were looking for.

a.  $a^4 = (a^2)^2$ ,  $49 = 7^2$ ,  $14a^2 = 2 \cdot a^2 \cdot 7$ , so:  $(a^2 + 7)^2 = 14a^2 + a^4 + 49$ .

b.  $x^{10} = (x^5)^2$ ,  $9 = (-3)^2$ ,  $-6x^5 = 2 \cdot x^5 \cdot (-3)$ , so:  $(x^5 - 3)^2 = x^{10} - 6x^5 + 9$ .

c.  $\frac{1}{64} = \left(\frac{1}{8}\right)^2$ ,  $y^8 = (-y^4)^2$ ,  $-\frac{1}{4}y^4 = 2 \cdot \frac{1}{8} \cdot (-y^4)$ , so:  $\left(\frac{1}{8} - y^4\right)^2 = \frac{1}{64} + y^8 - \frac{1}{4}y^4$ .