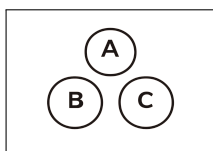
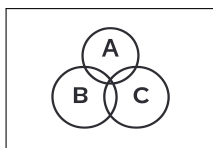


15 Completing the Square

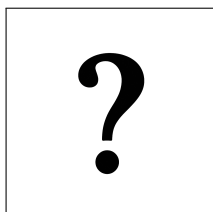
A



$$\begin{aligned}x^2 + 8x + 7 &= x^2 + 8x + (16 - 16) + 7 \\x^2 + 8x + 7 &= x^2 + 8x + 16 + (-16 + 7) \\x^2 + 8x + 7 &= (x + 4)^2 - 9\end{aligned}$$



$$\begin{aligned}x^2 + ax + b &= x^2 + ax + \left(\frac{a}{2}\right)^2 - \left(\frac{a}{2}\right)^2 + b \\x^2 + ax + b &= \left(x + \frac{a}{2}\right)^2 + \left(b - \frac{a^2}{4}\right)\end{aligned}$$



$$2x^2 + 12x + 5 = ?$$

15 Completing the Square

A



$$\begin{aligned}2x^2 + 12x + 5 &= 2(x^2 + 6x) + 5 \\2x^2 + 12x + 5 &= 2(x^2 + 6x + 9 - 9) + 5 \\2x^2 + 12x + 5 &= 2((x + 3)^2 - 9) + 5 \\2x^2 + 12x + 5 &= 2(x + 3)^2 - 18 + 5 \\2x^2 + 12x + 5 &= 2(x + 3)^2 - 13\end{aligned}$$