# Answer key

**The method: Composition of functions**

f(g(x)) means put all of g(x) in for x in f. Work from the inside out.

$f(x) = -2x + 1,\quad g(x) = -x^2 - 9;\quad f(g(3)) = 37$

$g(3) = -(3)^2 - 9 = -18$ inside first

$f(-18) = -2(-18) + 1 = 37$ then the outside

$f(x) = -2x^2 + x - 1,\quad g(x) = -x - 7;\quad g(f(x)) = 2x^2 - x - 6$

$g(f(x)) = -(-2x^2 + x - 1) - 7 = 2x^2 - x - 6$ put all of f(x) in for x, then simplify

$f(x) = 2x + 6,\quad g(x) = x - 5;\quad f(g(x)) = 2x - 4$

$f(g(x)) = 2(x - 5) + 6 = 2x - 4$ put all of g(x) in for x, then simplify

**Problems 1 and 2 worked out · Version 0A**

$f(x) = x^2 + 2x + 9,\quad g(x) = -2x - 7;\quad f(g(-3)) = 8$

$g(-3) = -2(-3) - 7 = -1$ inside first

$f(-1) = (-1)^2 + 2(-1) + 9 = 8$ then the outside

$f(x) = -x,\quad g(x) = 3x + 9;\quad f(g(x)) = -3x - 9$

$f(g(x)) = -(3x + 9) = -3x - 9$ put all of g(x) in for x, then simplify

**Composition of functions · Version 0A**

1) 8  2) $-3x - 9$  3) $-2x^2 + 14x - 27$  4) 8
5) $-3x + 6$  6) 24  7) $3x^2 - 9x + 25$  8) $-9x - 23$
9) $-x^2 - 8x - 23$  10) $6x - 17$  11) $2x^2 + 3x + 14$
12) 6  13) $4x - 1$  14) $-12x - 20$
15) $2x^2 - 4x + 4$  16) $-13$  17) $-12x$  18) $-2x + 4$