

# Further Maths GCSE Functions Answers

1. Area =  $\frac{(4+2)}{2} \times 3$   
= 9

2.  $f(n) = n^2 + n$   
 $f(n+1) = (n+1)^2 + (n+1) = n^2 + 3n + 2$   
 $f(n+1) - f(n) = (n^2 + 3n + 2) - (n^2 + n) = 2n + 2$

3.

4.  $g(x) = x^3 + 3x^2$   
 $g(3x) = (3x)^3 + 3(3x)^2$   
 $= 27x^3 + 27x^2$   
 $= 27x^2(x+1)$

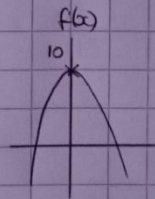
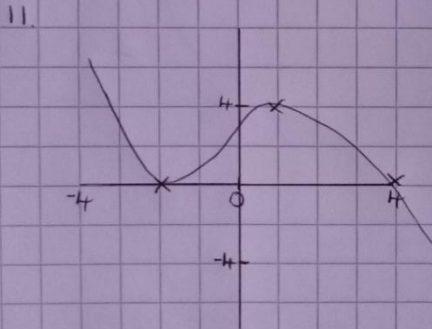
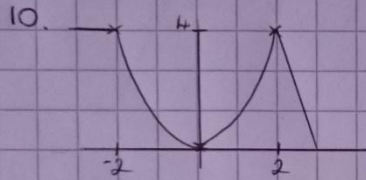
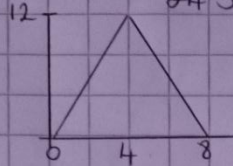
5.

6.

7.

8.  $f(x) = 3x - 5$   
 $f(x^2) = 3x^2 - 5$   
 $= 3x^2 - 5$   
 $f(x^2) = 43 \Rightarrow 3x^2 - 5 = 43$   
 $3x^2 = 48$   
 $x^2 = 16$   
 $x = 4 \text{ or } -4$

9.  $f(x) = 3x \quad 0 \leq x \leq 4$   
 $= 24 + 3x \quad 4 < x \leq 8$



12.  $f(-4) = 10 - (-4)^2 = -6$   
 $f(x) \leq 10$

$$g(0) = (x+2)(x+3) = 6a = 24$$

so  $a = 4$

$$f(x) = g(x) \quad 10 - x^2 = (x+8)(x+3) = x^2 + 11x + 24$$

$$2x^2 + 11x + 14 = 0 \quad (2x+7)(x+4) = 0 \quad x = -4 \text{ or } -3.5$$