Test - Functions and graph transformations

Year: Year 11 · Duration: 45 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Function notation (Higher)

$f(x) = 2x^2 - 3$.

a. Work out $f(4)$. (1 mark)
b. Solve $f(x) = 15$. (3 marks)

Question 2 (4 marks)

Question 2 – Composite functions (Higher)

$f(x) = x + 4$ and $g(x) = 3x$.

a. Find $fg(x)$ and $gf(x)$. (2 marks)
b. Solve $fg(x) = gf(x)$ and comment on your answer. (2 marks)

Question 3 (4 marks)

Question 3 – Inverse (Higher)

$f(x) = \dfrac{x - 5}{2}$.

a. Find $f^{-1}(x)$. (2 marks)
b. Work out $f^{-1}(7)$ and check that $f(f^{-1}(7)) = 7$. (2 marks)

Question 4 (4 marks)

Question 4 – Transformations of graphs (Higher)

The graph of $y = f(x)$ has a maximum point at $(3, 6)$.

a. Write the maximum point on $y = f(x - 2)$ and $y = f(x) + 4$. (2 marks)
b. Write the coordinates of the turning point on $y = -f(x)$ and say if it is a maximum or minimum. (2 marks)

Question 5 (4 marks)

Question 5 – Problem: completing the square (Higher)

$g(x) = x^2 - 6x + 5$.

a. Write $g(x)$ in the form $(x + a)^2 + b$. (2 marks)
b. State the transformation that maps $y = x^2$ to $y = g(x)$ and the minimum value of g. (2 marks)