Maths Methods year 12 Investigation 2
LOGARITHMIC FUNCTIONS PART B

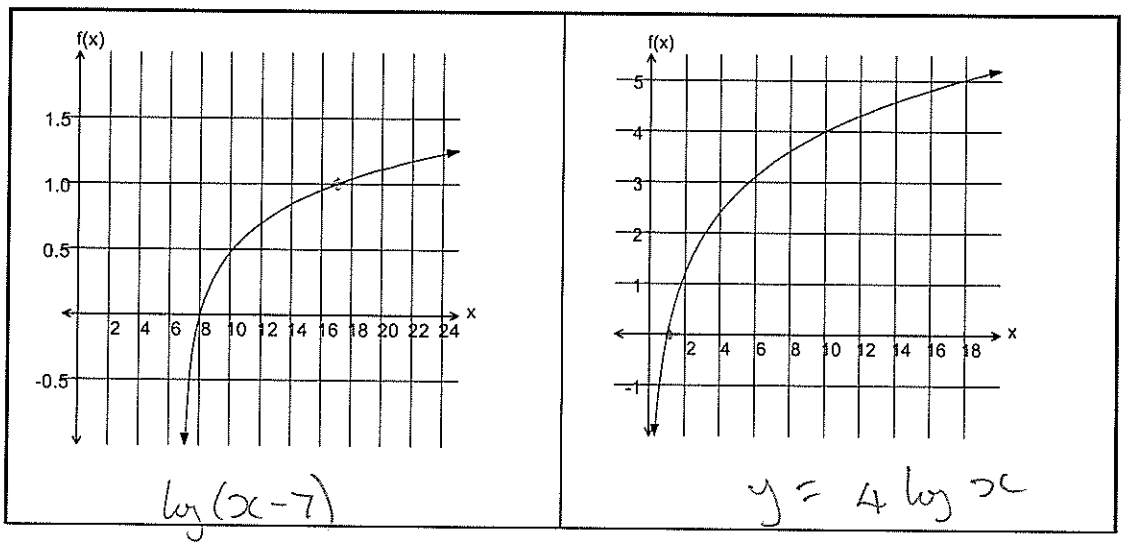
NAME John. **40 minutes** **22 marks**

1. The following graphs are transformations of the graph of $y = \log x$.
State the equation of each function.

(1,0) (8,0)
(10,1) (17,1)

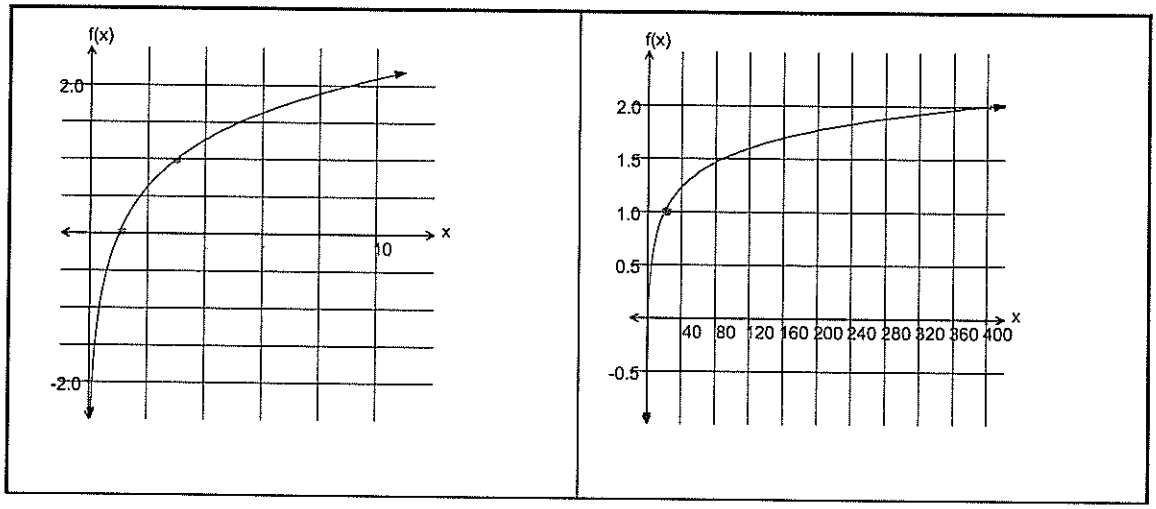
(1,0)
(10,4)

$\log(x-7)$

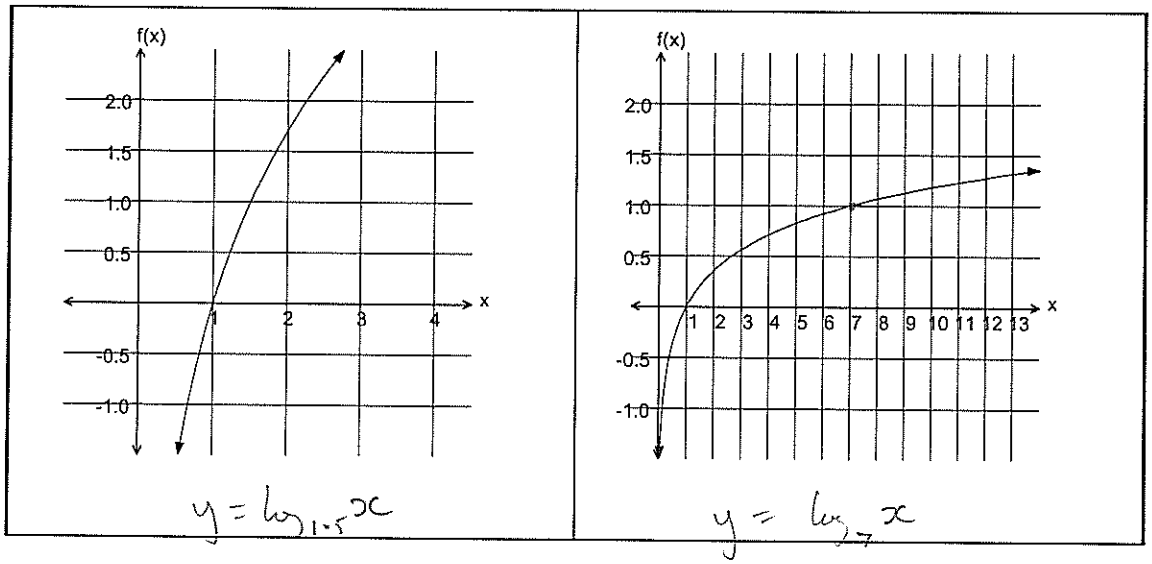


$\log(x-7)$ $y = 4\log x$

2. The function graphed in each of the following graphs is of the form $y = \log_k x$.
Examine these graphs and then determine its equation.



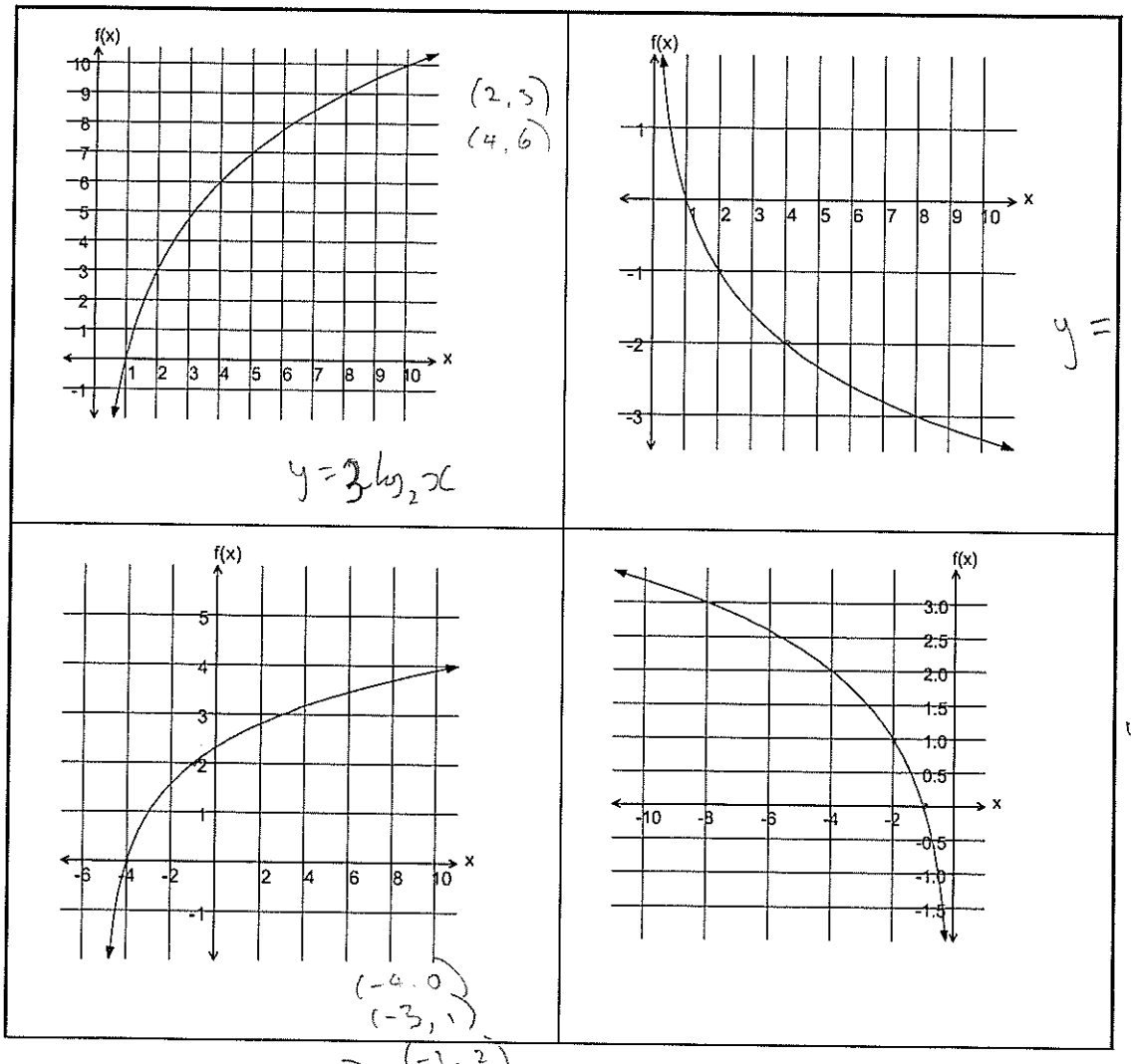
$\log_3 x$ $\log_{20} x$



$y = \log_{1.5} x$

$y = \log_{.7} x$

3. Determine the equation of the function graphed in each of the following, given that the graph is a transformation of the graph of $y = \log_2 x$.



(2, 3)
(4, 6)

$y = 3\log_2 x$

(1, 0)
(2, 1)
(4, 2)

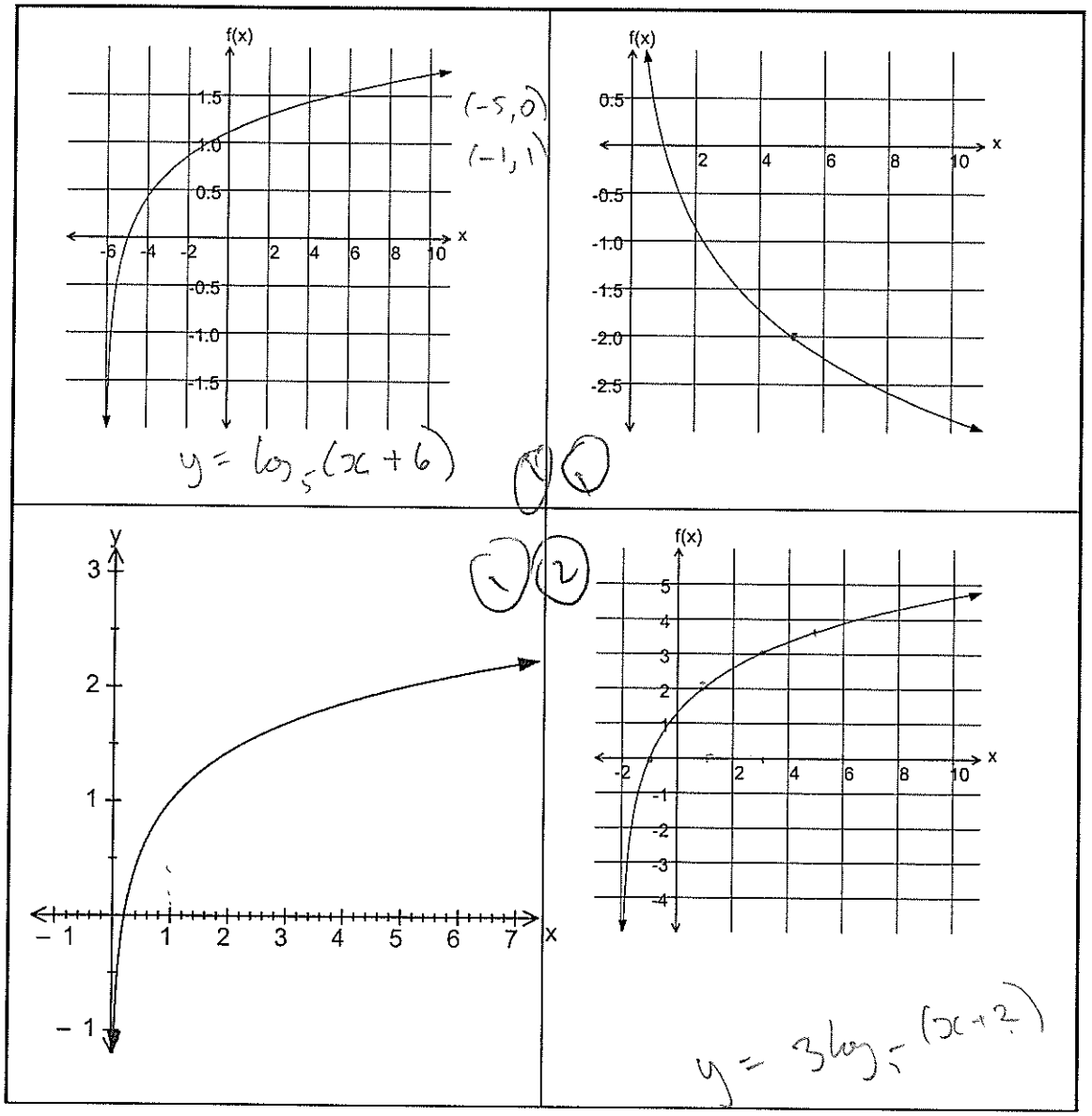
$y = -\log_2 x$

(-4, 0)
(-3, 1)
(-1, 2)

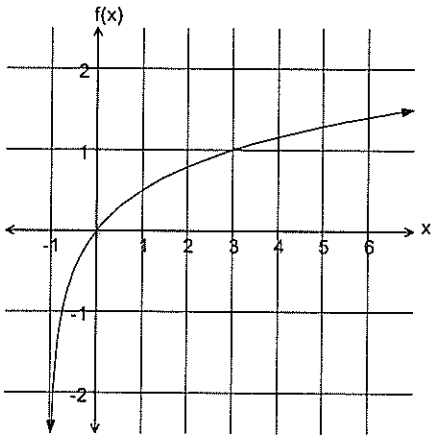
$y = \log_2(x+5)$

$y = \log_2(-x)$

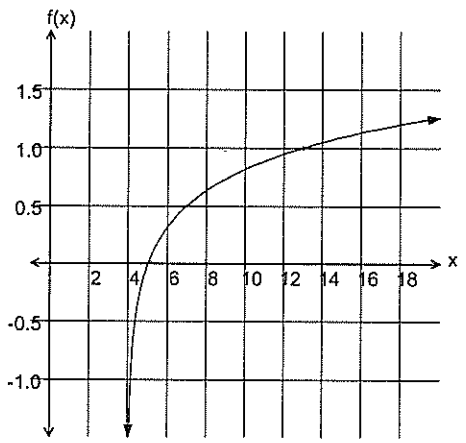
4. Each of the following graphs is a transformation of the function $y = \log_5 x$. Determine the equation of each function.



5. The following are graphs of functions of the form $y = \log_b(x + c)$. Determine the value of b and c in each case.

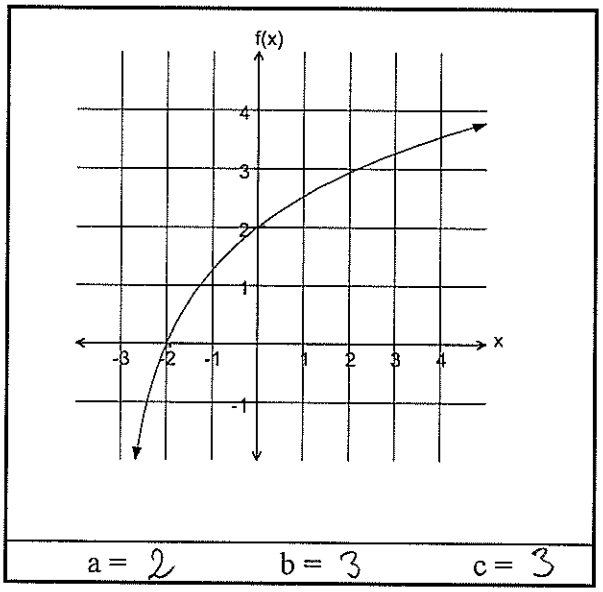


b = 4 c = 1



b = 9 c = −4

6. The following graph is a function of the form $y = a\log_b(x + c)$. Determine the values of a, b, and c.



a = 2 b = 3 c = 3