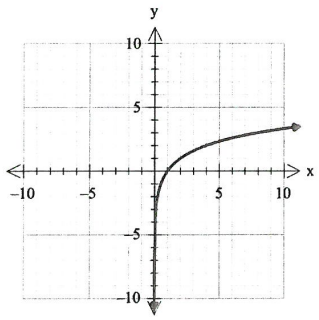
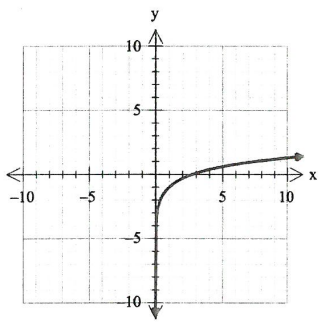
6 Match the graphs below with the appropriate logarithmic function. (4)

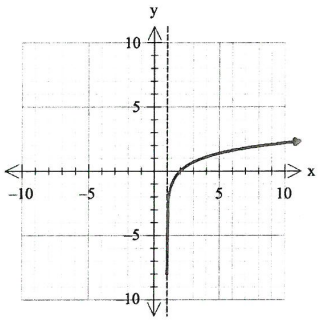
A



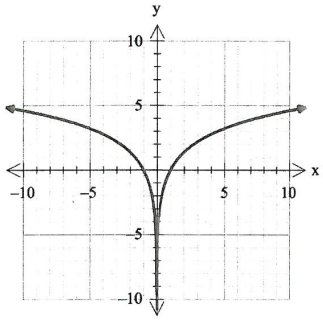
B



C



D



..... $y = \ln x^2$

..... $y = \ln(x - 1)$

..... $y = \ln x - 1$

..... $y = \log_2 x$

SHENTON COLLEGE

ATMAM Mathematics Methods

Test 3 Calculator Free

Name: .....

Teacher: Friday Smith

Time Allowed : 25 minutes

Marks /33

Materials allowed: Formula Sheet.

All necessary working and reasoning must be shown for full marks.
Marks may not be awarded for untidy or poorly arranged work.

1 Evaluate the following logarithms

a) $\log 1000$

b) $\log_7 \frac{1}{49}$ (1, 1)

c) $\log_{27} 3$

d) $3^{\left(\frac{\ln 4}{\ln 3}\right)}$ (1, 2)

2 Express the following as single logarithms.

a) $4\log_5 x - 3\log_5 \frac{1}{y}$

b) $\log_3 y^2 - \log_3 x + 4$ (2, 2)

3 If $p = \log_2 5$ and $q = \log_2 3$, express the following in terms of p and q.

a) $\log_2 1.8$ b) $\log_2 60$ (2, 2)

4 Use natural logarithms to solve the following equations. Express your answers using the fewest logs possible.

a) $3^{2x} = 5^{x+1}$ (4)

b) $2^{x+3} - 21 = 2^x$ (4)

5 Find $\frac{dy}{dx}$ for each of the following functions.

a) $y = e^{\ln x^2}$ (2)

b) $y = \ln\left(\frac{x+1}{(x-3)^2}\right)$ (2)

c) $y = \sin x \ln x$ (2)

d) $y = \log_5(5x - 5)$ (2)