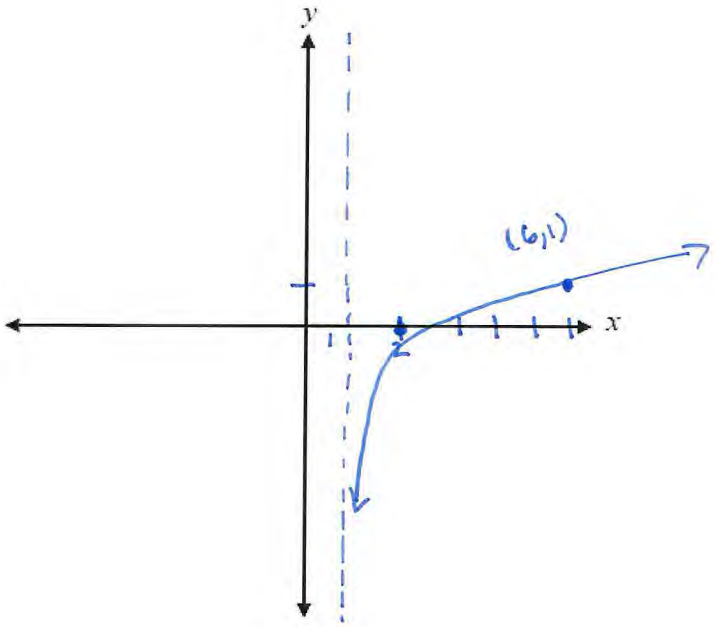
Exponential and Log Graphs

June 2015

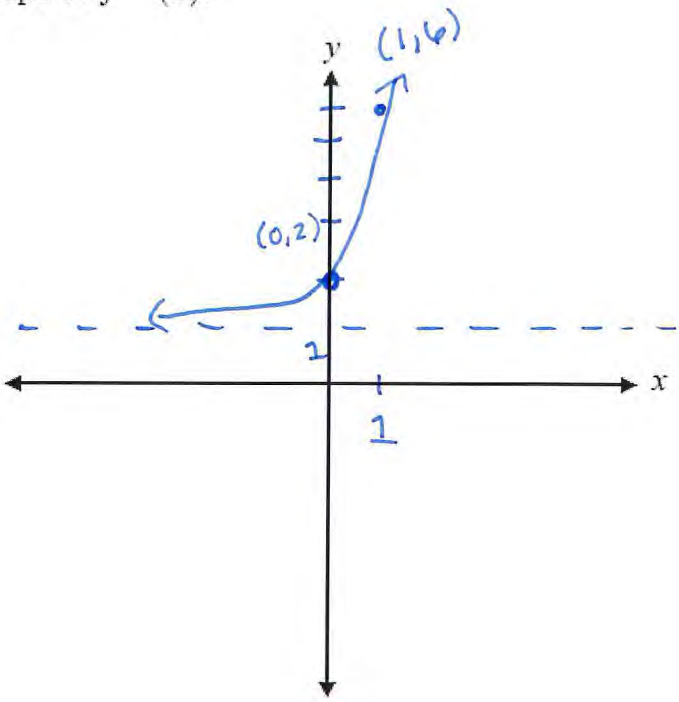
Question 33

a) 2 marks b) 1 mark

a) Sketch the graph of $f(x) = \log_5(x-1)$.



b) Sketch the graph of $f^{-1}(x)$.



Question 18 — 1 mark

The x-intercept of the graph of $y = 3^x - 1$ is:

a) -1

b) 0

c) 1

d) 2

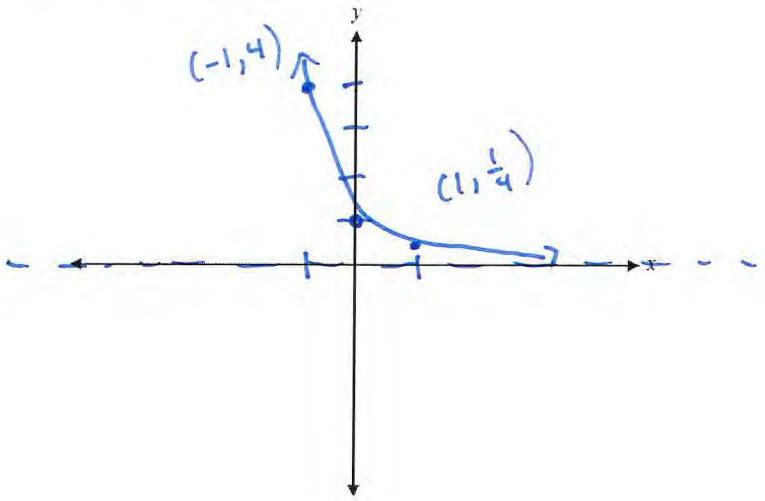
$0 = 3^x - 1$

$1 = 3^x$

$3^0 = 1$

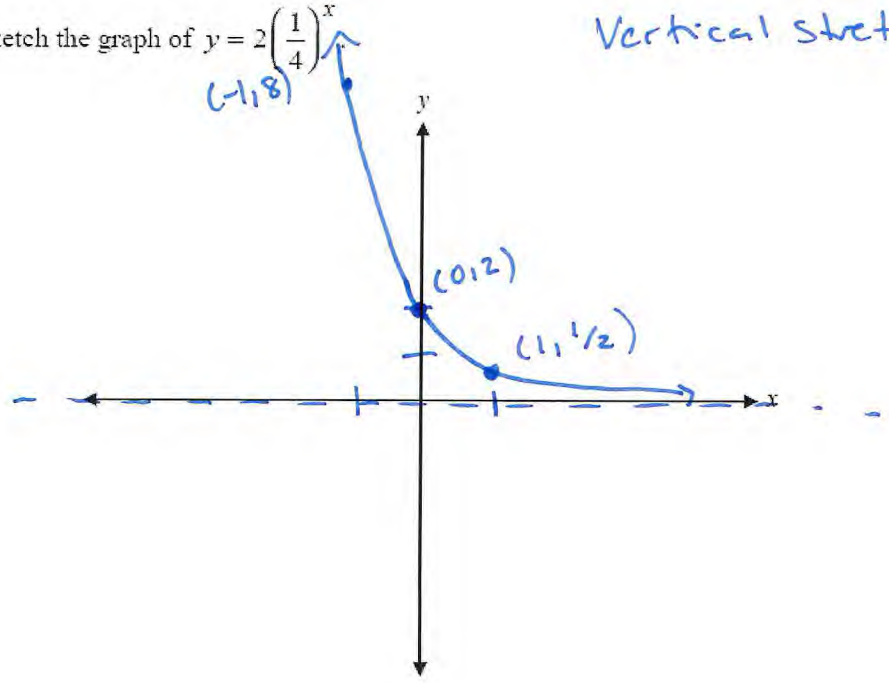
Question 26 — a) 2 marks b) 1 mark

a) Sketch the graph of $y = \left(\frac{1}{4}\right)^x$.



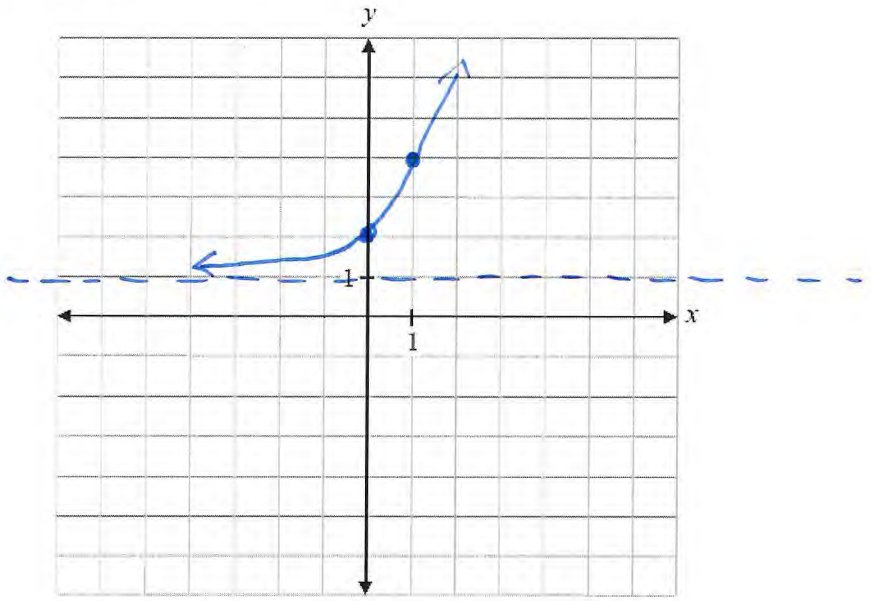
b) Sketch the graph of $y = 2\left(\frac{1}{4}\right)^x$.

Vertical stretch by factor of 2

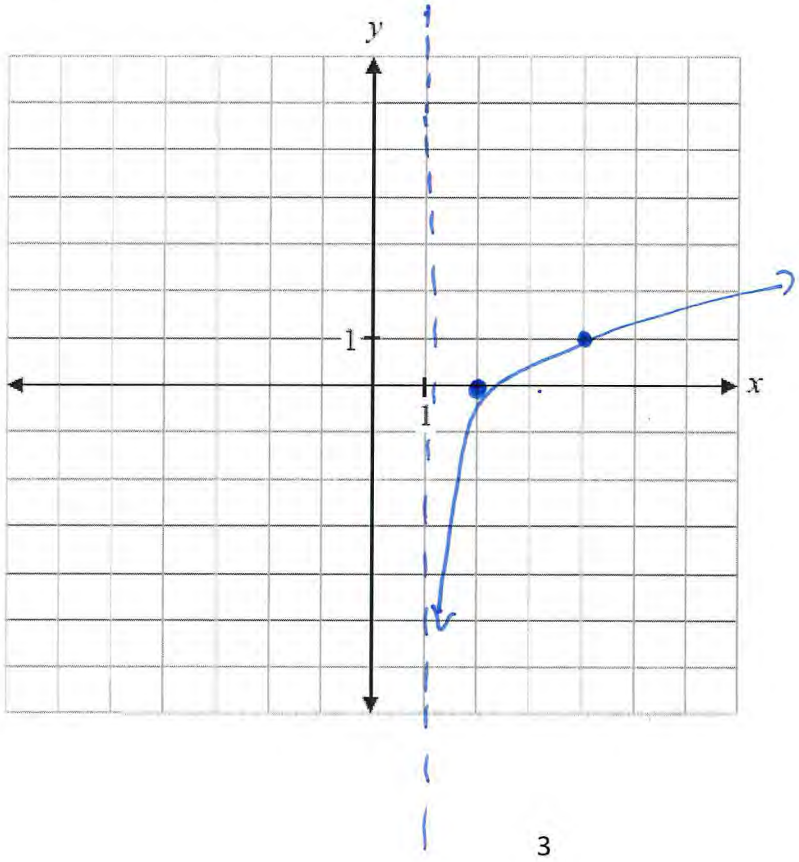


Question 34 — a) 2 marks b) 1 mark

a) Sketch the graph of $f(x) = 3^x + 1$.



b) Sketch the graph of $f^{-1}(x)$.



Question 35 — 2 marks

Determine the x-intercept and y-intercept of $y = \log_2(x+4) - 1$.

x int: $0 = \log_2(x+4) - 1$

$1 = \log_2(x+4)$

$2^1 = x+4$

$-2 = x$

y int: $y = \log_2(4) - 1$

$y = 2 - 1$

$y = 1$

January 2014

Question 17 — 1 mark

The graph of $y = \log_2(2x+6)$ intersects the graph of $y = 4$ at:

$4 = \log_2(2x+6)$

$2^4 = 2x+6$

$16 = 2x+6$

$10 = 2x$

$5 = x$

a) $x = -1$ b) $x = 1$ c) $x = 5$ d) $x = 14$

Question 19 — 1 mark

The graph of $y = \left(\frac{1}{2}\right)^x$ compared to the graph of $x = \left(\frac{1}{2}\right)^y$ is a:

inverses of each other!

a) reflection in the x-axis

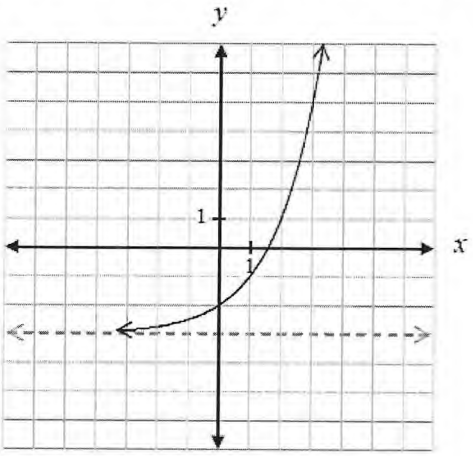
b) reflection in the y-axis

c) reflection in the line $y = x$

d) reciprocal function

Question 23 — 1 mark

The graph of the function $f(x)$ shown below is best described by the equation:



a) $f(x) = 2^{x+3}$ b) $f(x) = 2^x + 3$ c) $f(x) = 2^{x-3}$ d) $f(x) = 2^x - 3$

Question 23 — 1 mark

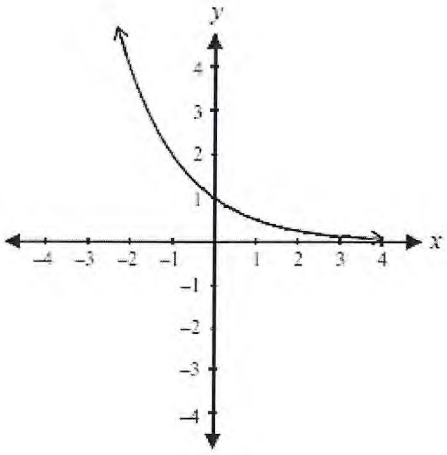
Which equation is represented by the graph sketched below?

a) $y = \left(\frac{1}{2}\right)^{-x}$

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

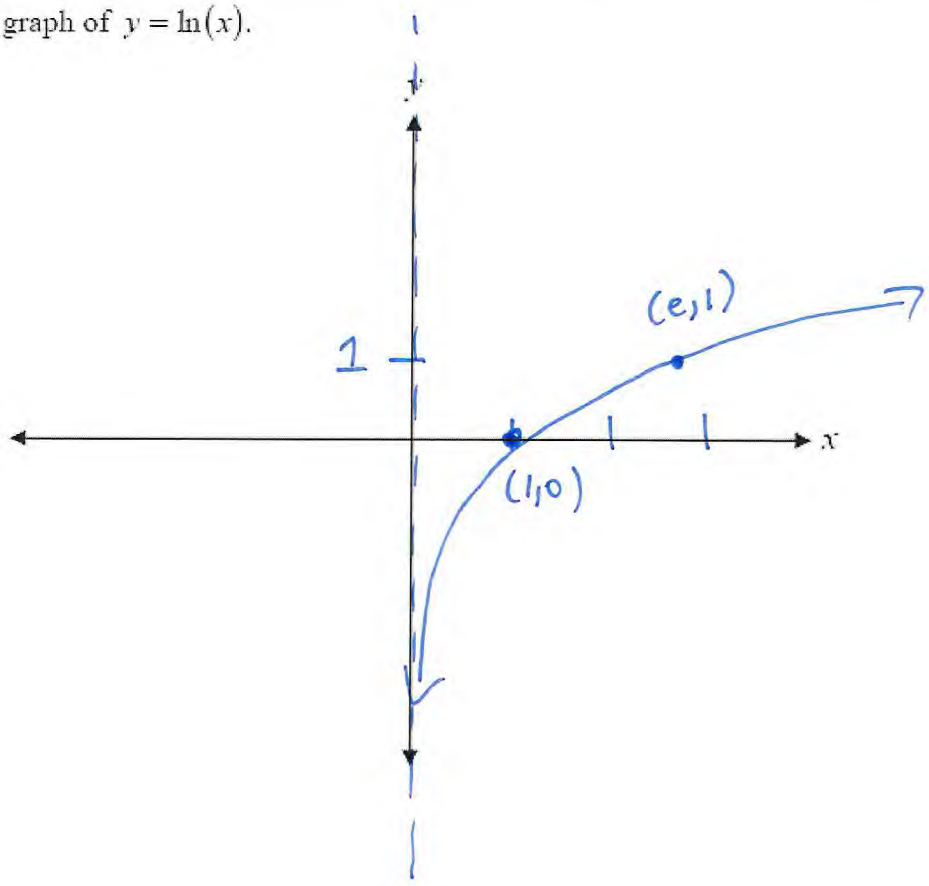
c) $y = 2^{x}$

d) $y = -2^{x}$



Question 40 — a) 2 marks b) 2 marks

a) Sketch the graph of $y = \ln(x)$.



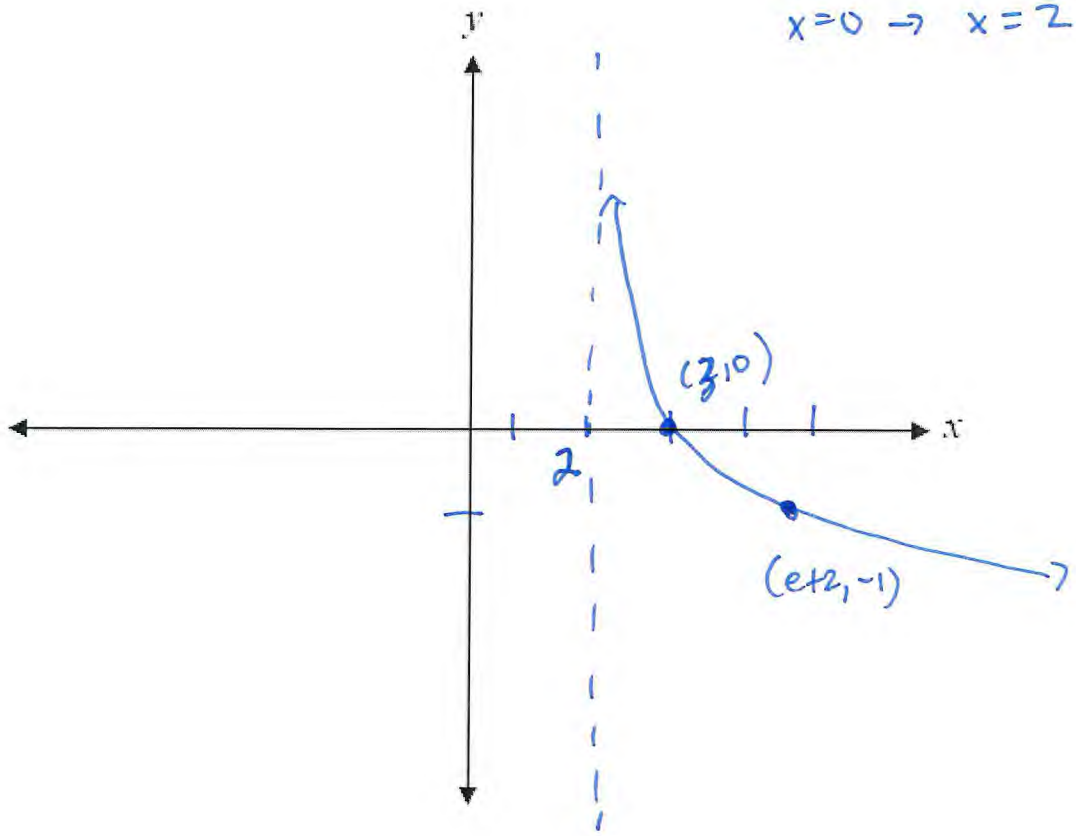
$(x,y) \to (x+2, -y)$

$(1,0) \to (3,0)$

$(e,1) \to (e+2, -1)$

$x=0 \to x=2$

b) Sketch the graph of $y = -\ln(x-2)$.



January 2013

Question 24

1 mark

Identify the value of the x-intercept of the function $y = \ln(x-2)$. → shift right 2.

a) -1 b) 0 c) 2 d) 3

$(1,0) \to (3,0)$.

Algebraically

$0 = \ln(x-2)$

$e^0 = x-2$

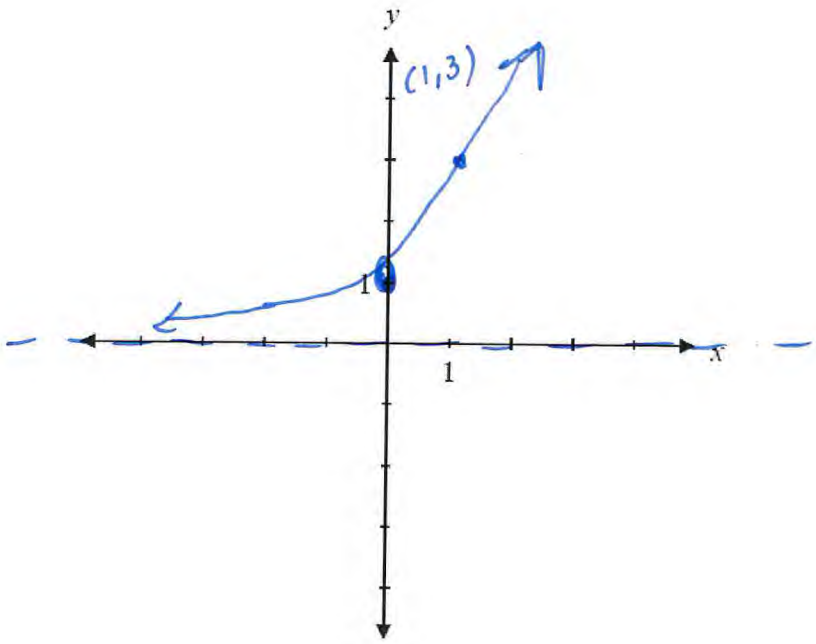
$1+2 = x$

$3 = x$

Question 30

a) 2 marks b) 1 mark

a) Sketch the graph of $y = 3^x$.



b) Explain how the graph of $y = 3^x$ can be used to sketch the graph of $y = \log_3 x$.

These functions are inverses of each other. The coordinates (x,y) on $y = 3^x$ become (y,x) on $y = \log_3 x$

The graph of $y = 3^x$ reflects over the line $y = x$ to obtain $y = \log_3 x$

20. The range of the function $y = 2^x + 3$ is:

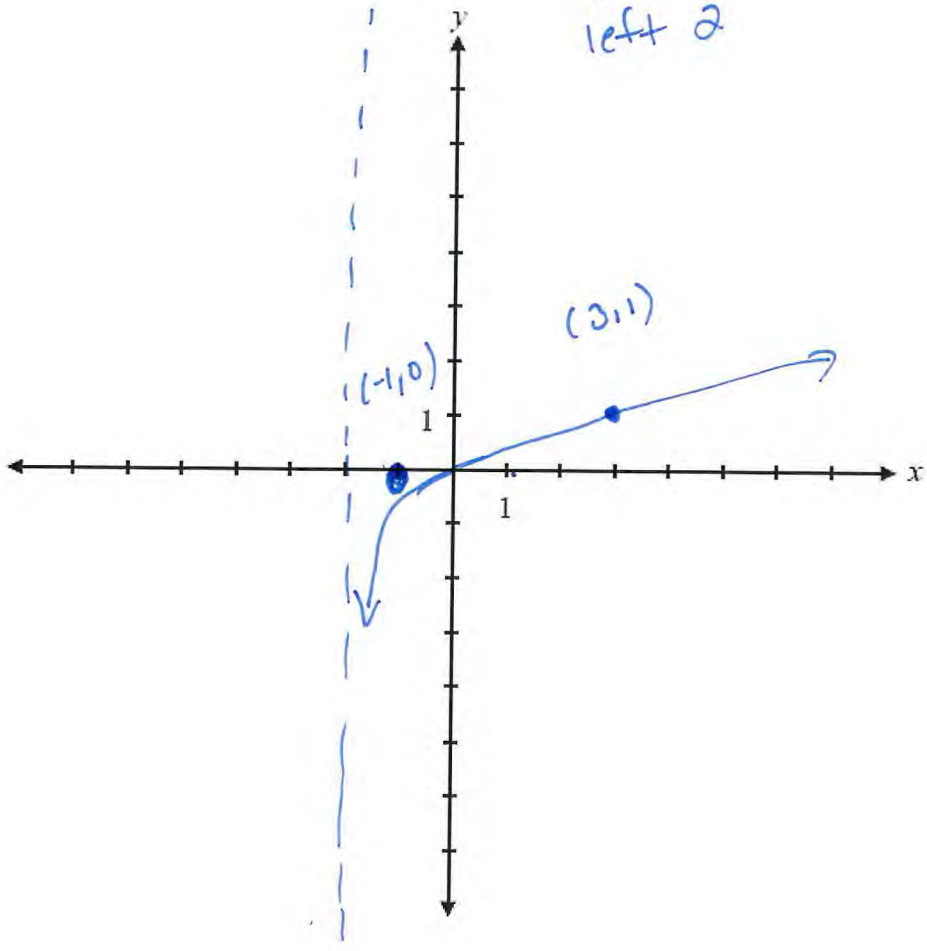
a) $(3, \infty)$

b) $(2, \infty)$

c) $(0, \infty)$

d) $(-\infty, \infty)$

45. Sketch a clearly labelled graph of $y = \log_5(x + 2)$.



left 2

$(x, y) \rightarrow (x-2, y)$

$(1,0) \rightarrow (-1,0)$

$(5,1) \rightarrow (3,1)$

$x = 0$ $x = -2$

January 2012

14. Find the y-intercept of $f(x) = -3^x - 2$.

$f(0) = -3^0 - 2$

$= -1 - 2$

$= -3$

a) $y = -5$

b) $y = -3$

c) $y = -2$

d) $y = 0$

18. State the equation of an asymptote for the graph of $f(x) = \ln x + 2$. → shifts up 2.

Asymptote remains

$x = 0$

a) $y = 0$

b) $x = 0$

c) $y = 2$

d) $x = -2$

June 2011

36. State the domain for the graph of the following function:

$y = \log_2(x + 3)$ shifts left 3. (graphically).

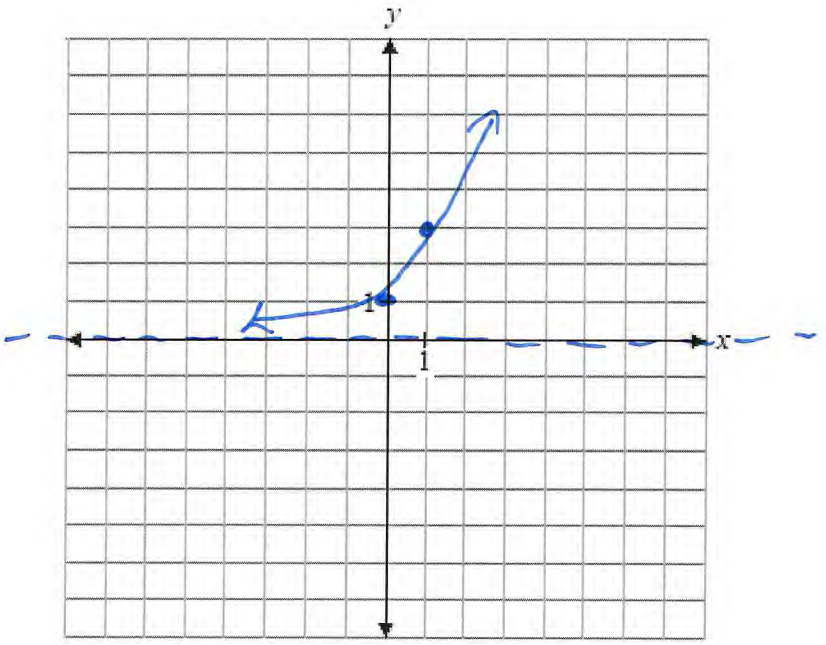
$x > -3$

Also, we know $x + 3 > 0$

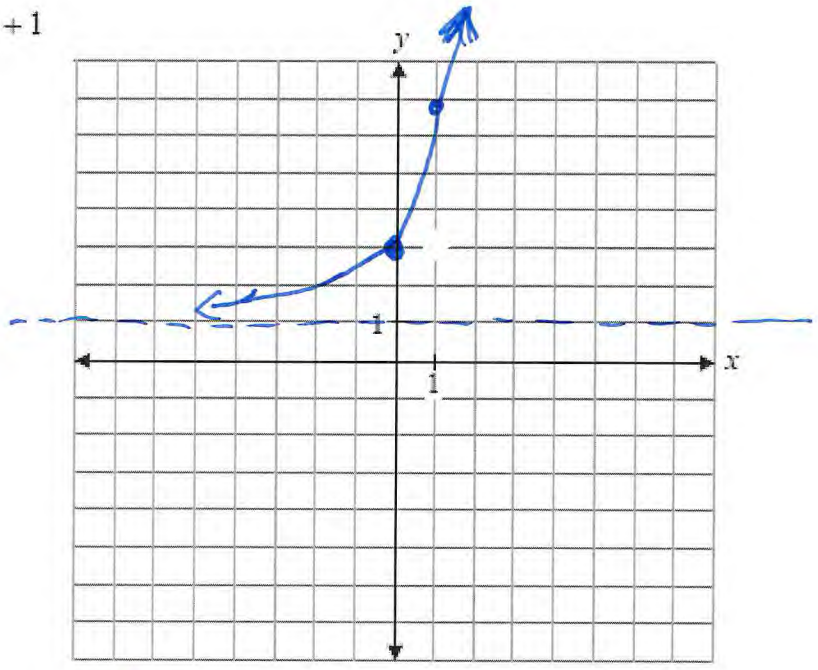
$x > -3$

43. Sketch a clearly labelled graph of:

a) $y = 3^x$



b) $y = 2(3^x) + 1$



$(x, y) \rightarrow (x, 2y+1)$

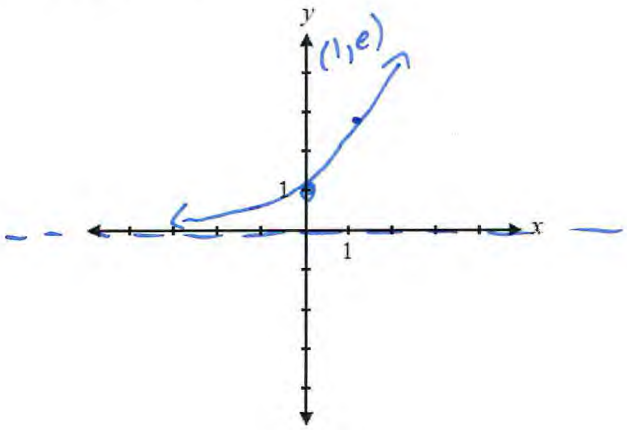
$(0,1)$ $(0,3)$

$(1,3)$ $(1,7)$

$y=0$ $y=1$

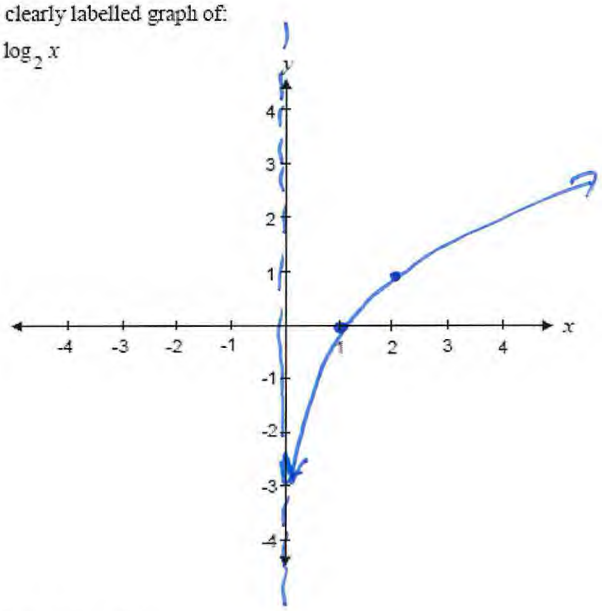
January 2011

34. Sketch the graph of $y = e^x$.

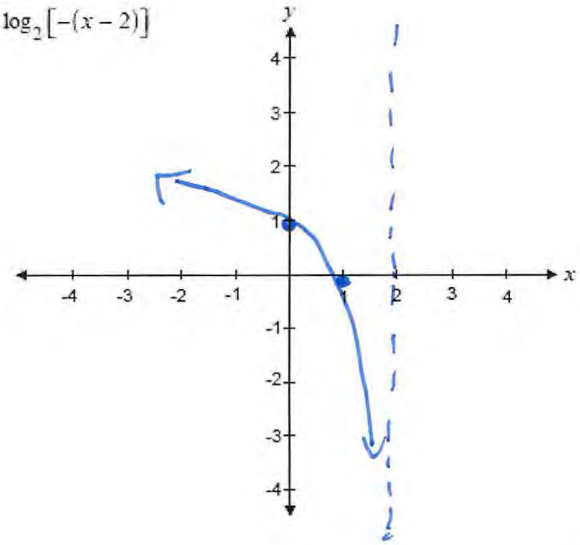


41. Sketch a clearly labelled graph of:

a) $y = \log_2 x$



b) $y = \log_2[-(x-2)]$



$(x, y) \rightarrow (-x+2, y)$

$(1,0) \rightarrow (1,0)$

$(2,1) \rightarrow (0,1)$

$(x=0 \rightarrow x=2$

June 2010

11. The y-intercept of $y = e^x + 3$ is:

a) 0

b) 1

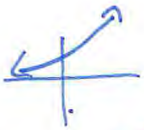
c) 3

d) 4

$y = e^0 + 3$

$y = 1 + 3$

$y = 4$

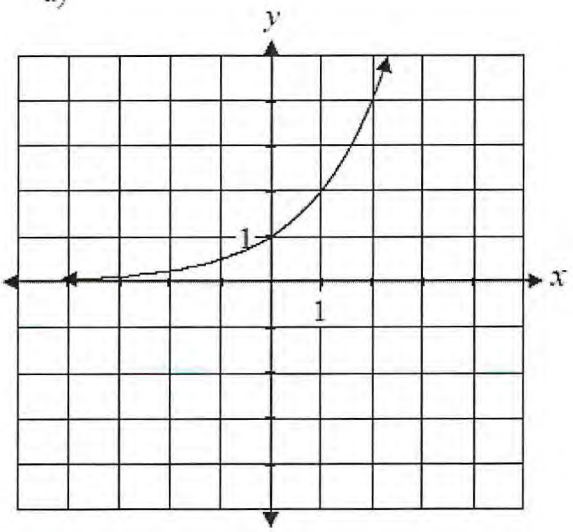


January 2010

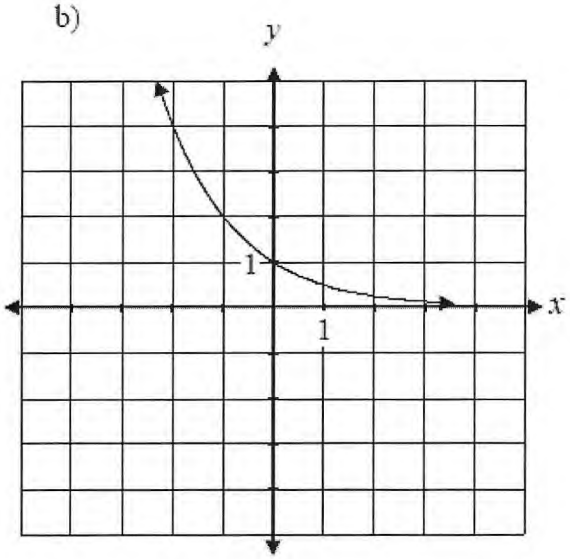
25. Which of the following graphs represents $y = -2^{-x}$?

reflect over x and y

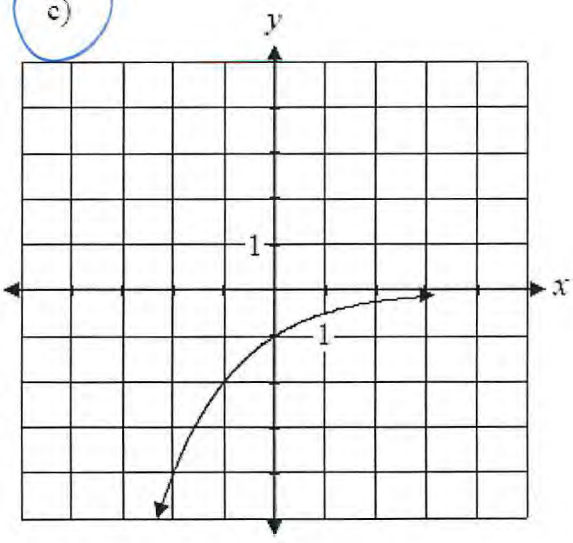
a)



b)



c)



d)