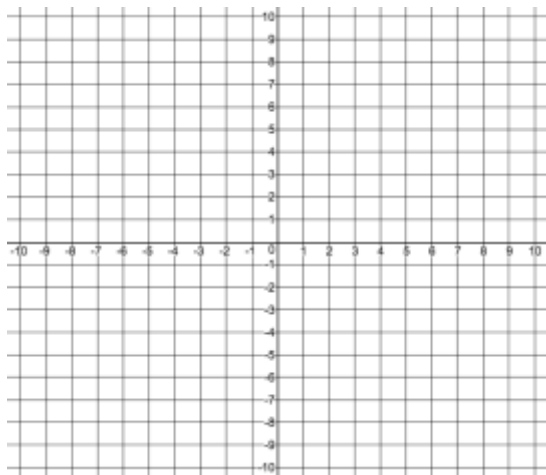1) Sketch a graph of each function. Then, sketch a graph of the inverse of each function. Label each graph with its equation.

a) $y = 2^x$
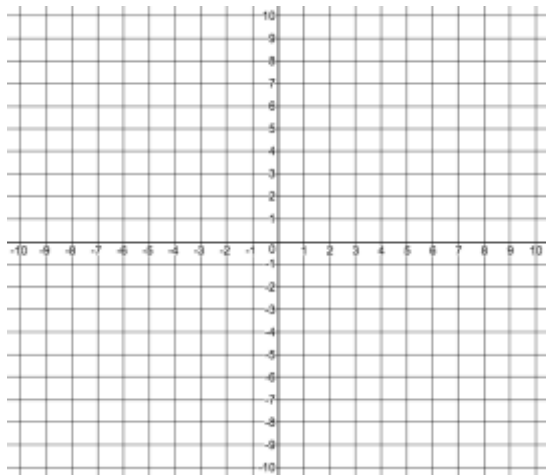
b) $y = 4^x$

2) Match each equation to its corresponding graph.

     A) $y = 5^x$ **B)** $y = \left(\frac{1}{2}\right)^x$ **C)** $y = 2^x$ **D)** $y = \left(\frac{1}{5}\right)^x$

3) An influenza virus is spreading according to the function $N = 10(2)^t$, where N is the number of people infected and t is the time, in days.

a) How many people have the virus at each time?

    i) initially, when $t = 0$ **ii)** after 1 day

    iii) after 2 days   **iv)** after 3 days

b) After how many days will 40960 people be infected?

4) Rewrite each equation in logarithmic form

a) $4^3 = 64$ **b)** $128 = 2^7$ **c)** $5^{-2} = \frac{1}{25}$

d) $\left(\frac{1}{2}\right)^2 = 0.25$ **e)** $6^x = y$ **f)** $10^5 = 100\ 000$

g) $\frac{1}{27} = 3^{-3}$

5) Evaluate each logarithm

a) $\log_2 64$

b) $\log_3 27$

c) $\log_2 \left(\frac{1}{4}\right)$

d) $\log_4 \left(\frac{1}{64}\right)$

e) $\log_5 125$

f) $\log_2 1024$

6) Evaluate each common logarithm

a) $\log 1000$

b) $\log \left(\frac{1}{10}\right)$

c) $\log 1$

d) $\log 0.001$

e) $\log 10^{-4}$

f) $\log 1\,000\,000$

7) Rewrite in exponential form

a) $\log_7 49 = 2$

b) $5 = \log_2 32$

c) $\log 10\,000 = 4$

d) $w = \log_b z$

e) $\log_2 8 = 3$

f) $-2 = \log \left(\frac{1}{100}\right)$

ANSWER KEY

1)a)

b)
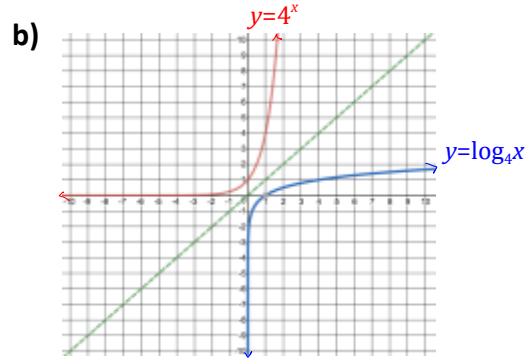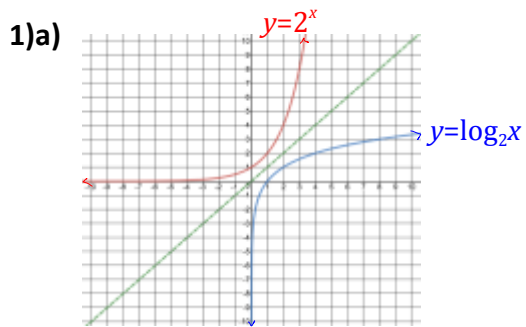
2) C A B D

3)a)i) 10 **ii)** 20 **iii)** 40 **iv)** 80 **b)** 12 days

4)a) $\log_4 64 = 3$ **b)** $\log_2 128 = 7$ **c)** $\log_5 \left(\frac{1}{25}\right) = -2$ **d)** $\log_{\frac{1}{2}} 0.25 = 2$ **e)** $\log_6 y = x$

f) $\log_{10} 100\ 000 = 5$ **g)** $\log_3 \left(\frac{1}{27}\right) = -3$

5)a) 6 **b)** 3 **c)** -2 **d)** -3 **e)** 3 **f)** 10

6)a) 3 **b)** -1 **c)** 0 **d)** -3 **e)** -4 **f)** 6

7)a) $7^2 = 49$ **b)** $2^5 = 32$ **c)** $10^4 = 10\ 000$ **d)** $b^w = z$ **e)** $2^3 = 8$ **f)** $10^{-2} = \frac{1}{100}$