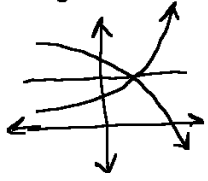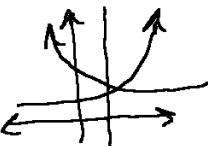① $y=2+5(1+e^{-x})$; $y=e^{-x}$

vertically stretch the graph
of $y=e^{-x}$ by factor of 5
and move up by ②

② Matching graphs to their
functions. Ez

③ $y=2^x$; reflect over
$y=4$

$f(x)=-2^x+8$

Now reflect over $x=2$

$x=2$

$f(x)=-2^{-x+4}$

logical reasoning ↑

④ $8^{6x-1} 8^{7-5x}$ as $8^{f(x)}$ then

$f(x)=6x-1+7-5x$

$f(x)=x+6$

⑤ $(3^{4x})^{2x}$ as $3^{f(x)}$ then

$f(x)=8x^2$

⑥ $\dfrac{e^x}{e^{3+x}}$ as $e^{f(x)}$ then

$f(x)=-3$

⑦ $(0,10)$ & $(4,100)$

$f(x)=$ linear function

$m=\dfrac{\Delta y}{\Delta x}=\dfrac{100-10}{4-0}=\dfrac{90}{4}$

$y=\dfrac{90}{4}x+b$; $100=90+b$; $b=10$

$y=\dfrac{90}{4}x+10$

⑥ $f(x)=$ exponential func

$f(x)=ab^x$

$10=ab^0$ & $100=ab^4$
then $a=10$
$100=10b^4$; $10=b^4$ then $\sqrt[4]{10}=b$

$f(x)=10\sqrt[4]{10}^x$

⑧ $A(-1,-\frac{2}{3})$ & $(1,-6)$ points

$f(x)=ba^x$

$\dfrac{-2}{3}=ba^{-1}$; $-6=ba^1$

$\dfrac{-2}{3}=\dfrac{b}{a}$; $-6=ba$

$-6=(-\frac{3}{2}b)b$; $b=\pm2$

$a=\dfrac{-3}{2}(2)=\boxed{-3}$ or $\boxed{3}$

Possible: $f(x)=2(-3)^x$ or
$f(x)=-2(3)^x$

matches graph

⑨ given conditions then of the question:

$$f(x) = 1000(2)^{\frac{x}{5}} \swarrow$$

① size after 15 hours

$$f(15) = 1000(8) = 8000$$

② size after 19 hours

$$1000(2)^{19/5} \approx 13928.8$$

⑩ given: Points: $(0, 1000)$

$$f(x) = 1000a^x + c$$

ⓐ linear function then:

$$f(x) = 90t + 1000$$

$$\downarrow \text{ exponential}$$

ⓑ new point: $(1, 0.09(1000))$

$$f(x) = 1000(1.09)^t \nearrow$$