HW # 23 (4.1) 48, 52 (4.2) 4, 10, 12, 14, 20, 22, 30, 32

48) a) $N(t) = 320(2^t)$

b) $N(8) = 320(2^8) = 81,920$ mice

52) $P = 2500$, $r = 0.025$, $n = 365$ so, $A(t) = 2500\left(1 + \frac{0.025}{365}\right)^{365t}$

a) $A(2) = 2500\left(1 + \frac{0.025}{365}\right)^{365 \cdot 2} \approx 2628.17 \Rightarrow$ \$2628.17

b) $A(3) = 2500\left(1 + \frac{0.025}{365}\right)^{365 \cdot 3} \approx 2694.70 \Rightarrow$ \$2694.70

c) $A(6) = 2500\left(1 + \frac{0.025}{365}\right)^{365 \cdot 6} \approx 2904.57 \Rightarrow$ \$2904.57

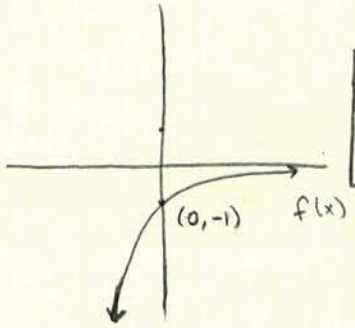
(4.2)

4) $h(x) = e^{-2x}$

$h(1)$	$= 0.135$
$h(\sqrt{2})$	$= 0.059$
$h(-3)$	$= 403.429$
$h(\frac{1}{2})$	$= 0.368$

10) $f(x) = -e^{-x}$ $g(x) = y = e^x$

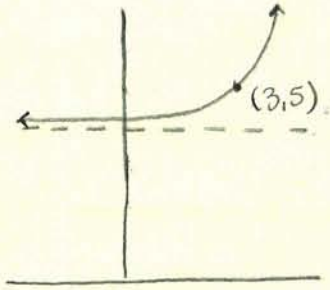
reflect $g(x)$ about y-axis, then about the x-axis



Domain: $(-\infty, \infty)$
Range: $(-\infty, 0)$
asymptotes: $y = 0$

12) $y = e^{x-3} + 4$ $f(x) = e^x$

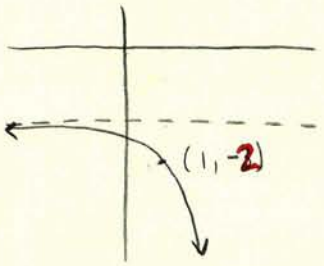
shift $f(x)$ right 3 units, and up 4 units.



Domain: $(-\infty, \infty)$
Range: $(4, \infty)$
Asymptote: $y = 4$

14) $g(x) = -e^{x-1} - 2$ $f(x) = e^x$

shift $f(x)$ right 1 unit, reflect it about x-axis, shift down 2 units



Domain: $(-\infty, \infty)$
Range: $(-\infty, -2)$
Asymptotes $y = -2$

20) $D(t) = 50e^{-0.2t}$

$D(3) = 50e^{-0.2(3)} \approx 27.4$ milligrams

22, 30, 32

22) $m(t) = 6e^{-0.087t}$

a) $m(0) = 6e^{(-0.087)(0)}$ $\approx$ **6 grams**

b) $m(20) = 6e^{-0.087(20)} \approx 6(0.1755) = 1.053$

so, approx. 1 gram of radioactive iodine remains after 20 days

30) using $A(t) = Pe^{rt}$, $P = 7000$ and $t = 10$ years

rate per year	Amount
1%	$7736.20
2%	$8549.82
3%	$9449.01
4%	$10,442.77
5%	$11,541.05
6%	$12,754.83

32) using $A(t) = Pe^{rt}$, $P = 3500$ and $r = 6.25\% = 0.0625$

a) $A(3) = 3500e^{0.0625(3)}$ $\approx$ **$4221.81**

b) $A(6) = 3500e^{0.0625(6)}$ $\approx$ **$5092.47**

c) $A(9) = 3500e^{0.0625(9)}$ $\approx$ **$6142.69**