

(1-6) Simplify the expression.

1)  $e^{-2} \cdot e^6$

$e^4$

2)  $(2e^{-2})^{-4}$

$\frac{e^8}{16}$

3)  $e^x \cdot e^{-3x} \cdot e^4$

$e^{-2x+4}$

4)  $e^x \cdot 5e^{x+3}$

$5e^{2x+3}$

5)  $\frac{4e^x}{e^{4x}}$

$\frac{4}{e^{3x}}$

6)  $\frac{6e^{4x}}{8e}$

$\frac{3e^{4x-1}}{4}$

7) MULTIPLE CHOICE What is the simplified form of  $\sqrt{\frac{4(27e^{13}x)}{3e^7x^{-3}}}$ ?

A.  $6e^{10}x$

B.  $6e^6x^4$

C.  $\frac{6e^3}{x^2}$

D.  $6e^3x^2$

8) Describe and correct the error in simplifying the expression.

$$\frac{e^{6x}}{e^{-2x}} = e^{6x-2x}$$
$$= e^{4x}$$



$-2x$  should be subtracted

$$e^{6x - (-2x)} = e^{8x}$$

(9-11) Use a calculator to evaluate the expression.

9)  $e^{-3/4}$

0.472  
or  
0.48

10)  $e^{1/2}$

1.65

11)  $5e^{2/3}$

9.74

(12-14) Match the function with its graph.

12)  $y = 0.5e^{0.5x}$

B

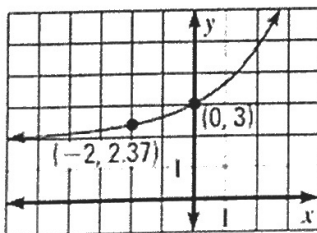
13)  $y = 2e^{0.5x}$

C

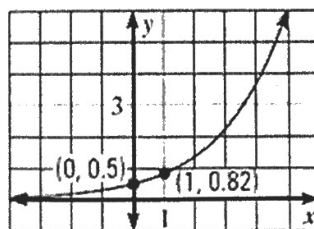
14)  $y = e^{0.5x} + 2$

A

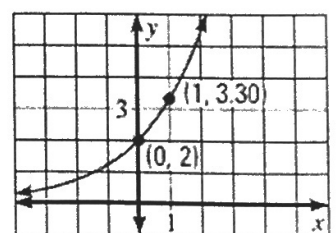
A.



B.



C.



(15-18) Tell whether the function is an example of exponential growth or exponential decay. Explain.

15)  $f(x) = \frac{1}{3}e^{4x}$

growth

16)  $f(x) = \frac{3}{5}e^x$

growth

17)  $f(x) = e^{3x}$

growth

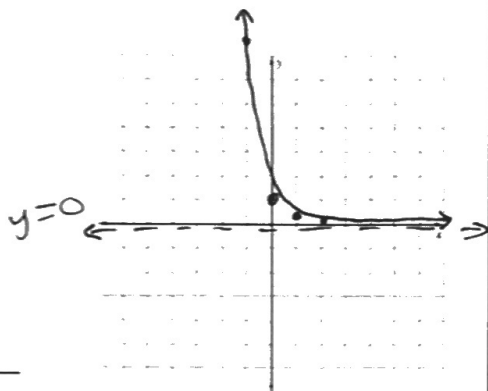
18)  $f(x) = 4e^{-2x}$

decay  
why? because  
 $(e^{-2}) = \frac{1}{e^2}$   
so  $0 < \frac{1}{e^2} < 1$

(19-22) Graph the function. State the domain and range.

19)  $y = e^{-2x}$

x	y
-2	54.60
-1	7.39
0	1
1	0.14
2	0.02

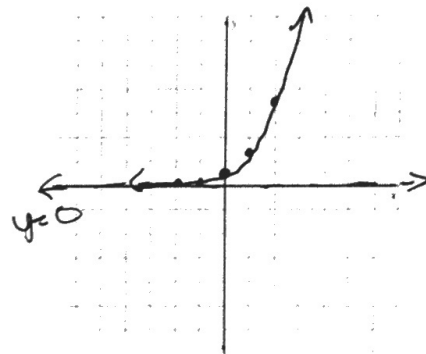


D:  $\mathbb{R}$

R:  $y > 0$

20)  $y = 0.5e^x$

x	y
-2	0.07
-1	0.18
0	0.5
1	1.36
2	3.69

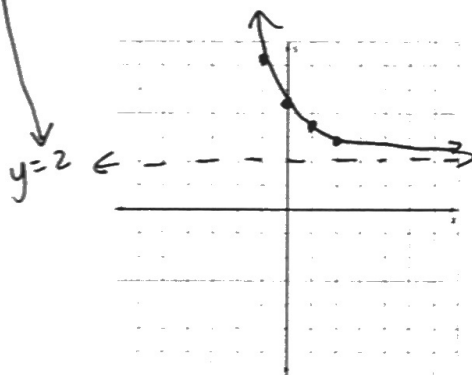


D:  $\mathbb{R}$

R:  $y > 0$

21)  $y = 2.5e^{-0.5x} + 2$

x	y
-2	9.80
-1	6.12
0	4.5
1	3.52
2	2.92

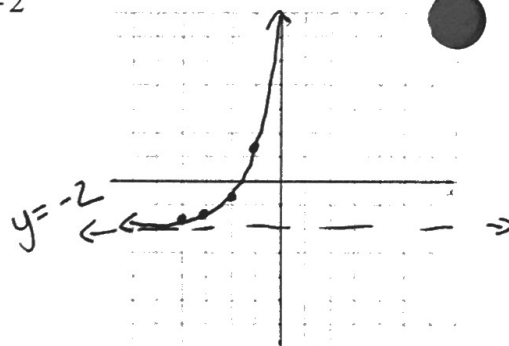


D:  $\mathbb{R}$

R:  $y > 2$

22)  $f(x) = \frac{1}{2}e^{x+3} - 2$

x	y
-4	-1.82
-3	-1.5
-2	-0.64
-1	1.69
0	8.04



D:  $\mathbb{R}$

R:  $y > -2$

23) Scientists used traps to study the Formosan subterranean termite population in New Orleans. The mean number  $y$  of termites collected annually can be modeled by  $y = 738e^{0.345t}$  where  $t$  is the number of years since 1989. What was the mean number of termites collected in 1999?

about 23,247 termites

24) You deposit \$2,000 in an account that pays 4% annual interest compounded continuously. What is the balance after 5 years?

\$ 2442.81