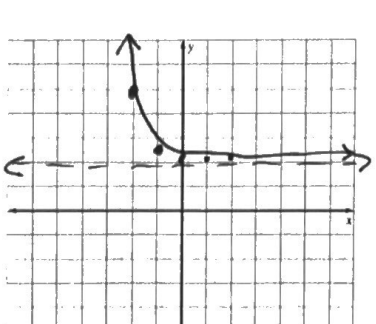
7.1-7.4 Algebra II Review

Name: Key

(1-6) Graph the function. State the domain and range and draw the asymptote.

1. $y = 3\left(\frac{1}{4}\right)^{x+2} + 2$

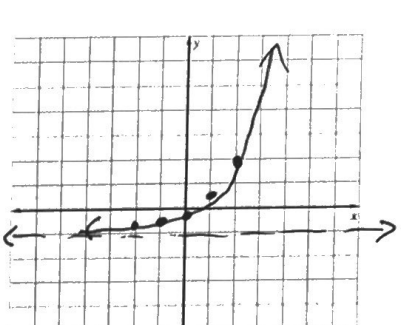
x	y
-2	5
-1	2.75
0	2.19
1	2.05
2	2.01



Domain: $\mathbb{R}$ Range: $y > 2$

2. $y = 3 \cdot 2^{x-2} - 1$

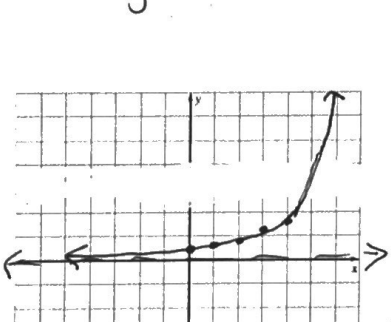
x	y
-2	-0.81
-1	-0.63
0	-0.25
1	0.5
2	2



Domain: $\mathbb{R}$ Range: $y > -1$

3. $y = 2e^{0.3(x-5)}$

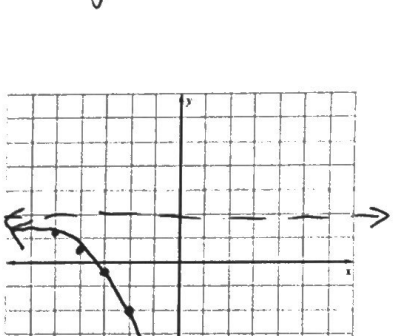
x	y
0	0.44
1	0.60
2	0.81
3	1.10
4	1.48



Domain: $\mathbb{R}$ Range: $y > 0$

4. $y = -4e^{0.5(x+2)} + 2$

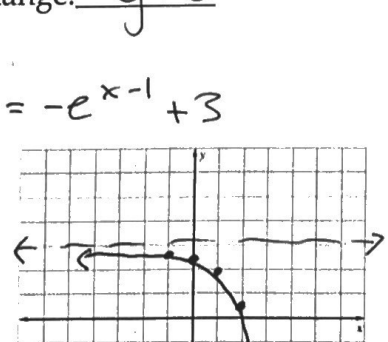
x	y
-5	1.10
-4	0.52
-3	-0.42
-2	-2
-1	-4.59



Domain: $\mathbb{R}$ Range: $y < 2$

5. $y = 3 - e^{x-1}$ ↔ $y = -e^{x-1} + 3$

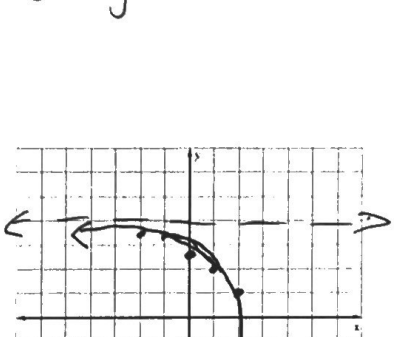
x	y
-1	2.86
0	2.63
1	2
2	0.28
3	-4.39



Domain: $\mathbb{R}$ Range: $y < 3$

6. $y = -2 \cdot \left(\frac{3}{2}\right)^{x-1} + 4$

x	y
-2	3.41
-1	3.11
0	2.67
1	2
2	1



Domain: $\mathbb{R}$ Range: $y < 4$

Exponential Growth Model $y = a(1+r)^t$	**Exponential Decay Model** $y = a(1-r)^t$
Compound Interest $A = P\left(1+\frac{r}{n}\right)^{nt}$	**Continuously Compounded Interest** $A = Pe^{rt}$

7. You purchase a new car for $8,025. It depreciates → decay at a rate of 18% per year. How much will your car be worth in 3 years?

$y = 8025(1-0.18)^3$ $\$4,424.73$

8. You put $2,500 in a savings account with an interest rate of 4.2%. If interest is compounded daily and you never make any additional deposits or withdrawals, how much money will be in your account after 2 years?

regular compound interest

$y = 2500\left(1+\frac{.042}{365}\right)^{365\cdot 2}$ $\$2,719.06$

9. You deposit $1500 in an account that pays 4.8% annual interest compounded continuously. What is the balance after 4 years?

→ $A = Pe^{rt}$

$y = 1500\, e^{.048\cdot 4} = \$1817.51$

10. You deposit $4600 in an account that pays .50% annual interest compounded continuously. What is the balance after 10 years?

→ $A = Pe^{rt}$

$y = 4600e^{.005\cdot 10} = \$4835.85$

11. You purchase an antique truck for $22,550. It appreciates at a rate of 3% per year. How much will your car be worth in 15 years?

→ growth

$y = 22550(1+.03)^{15} = \$35,132.20$

12. You put $12,000 in a savings account with an interest rate of 3.25%. If interest is compounded monthly and you never make any additional deposits or withdrawals, how much money will be in your account after 7 years?

$y = 1200\left(1+\frac{.0325}{12}\right)^{12\cdot 7} = \$15060.90$

(13-18) Evaluate the logarithm without using a calculator.

13. $\log_2 8$

$2^{\square} = 8$ **3**

14. $\log_6 1$

$6^{\square} = 1$?

0

15. $\log_5 5$

$5^{\square} = 5$?

1

16. $\log_{1/3} 27$

$(\frac{1}{3})^{\square} = 27$

−3

17. $\log_{625} 5$

$625^{\square} = 5$

$\frac{1}{4}$

18. $\log_{1/3} 81$

$(\frac{1}{3})^{\square} = 81$

−4

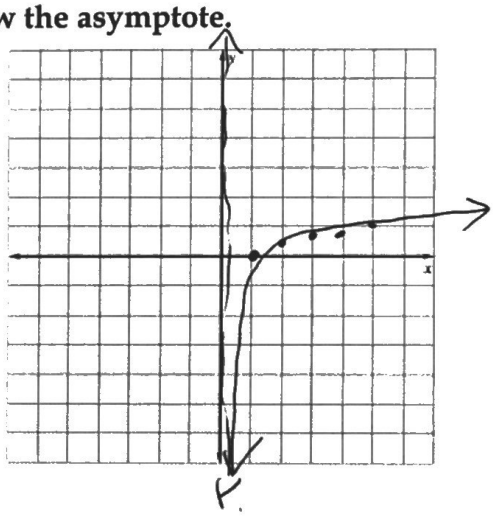
(19-20) Graph each function. State the domain and range and draw the asymptote.

19. $y = \log_5 x$

Domain: $x > 0$

Range: $\mathbb{R}$

x	y
1	0
2	0.43
3	0.68
4	0.86
5	1

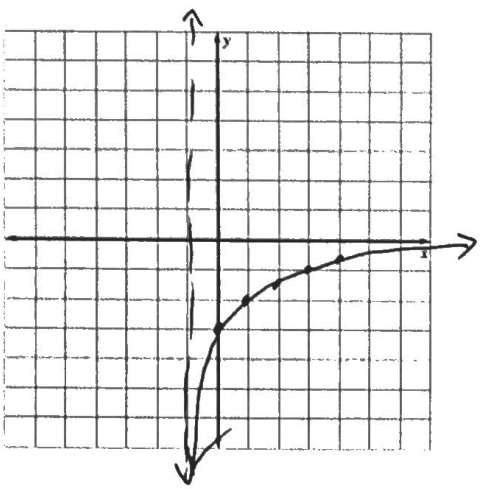


20. $y = \log_2(x+1) - 3$

Domain: $x > -1$

Range: $\mathbb{R}$

x	y
0	−3
1	−2
2	−1.42
3	−1
4	−0.7



(21-24) Find the inverse of the function.

21. $y = (0.4)^x$

$x = (0.4)^y$

$\log_{0.4} x = y$

22. $y = \log_8 x$

$x = \log_8 y$

$8^x = y$

23. $y = \ln(x-2)$

$x = \ln(y-2)$

$x = \log_e(y-2)$

$e^x = y - 2$

$e^x + 2 = y$

24. $y = 6^x + 5$

$x = 6^y + 5$

$x - 5 = 6^y$

$\log_6(x-5) = y$