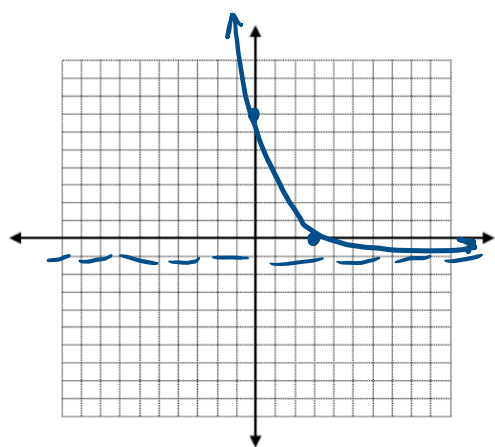


Graph the following Exponential Functions.

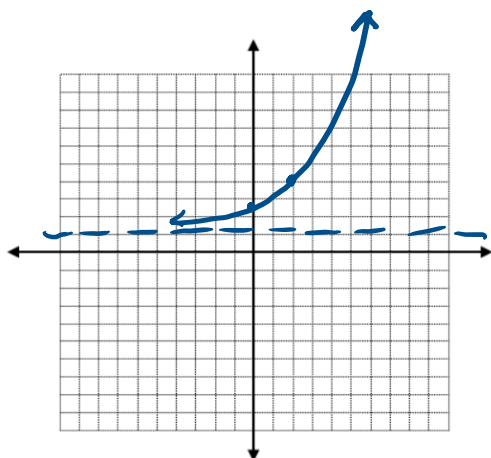
1. $y = 2^{x+3} - 1$

HA: $y = -1$
 y-int: $(0, 7)$
 $(-3, 0)$



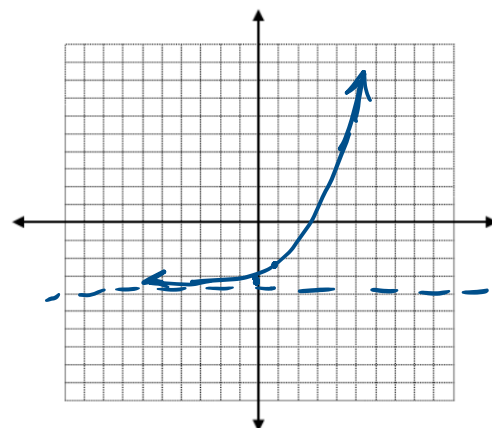
2. $y = 3\left(\frac{4}{3}\right)^{x-2} + 1$

HA: $y = 1$
 y-int: $(0, 2.6875)$
 $(2, 4)$



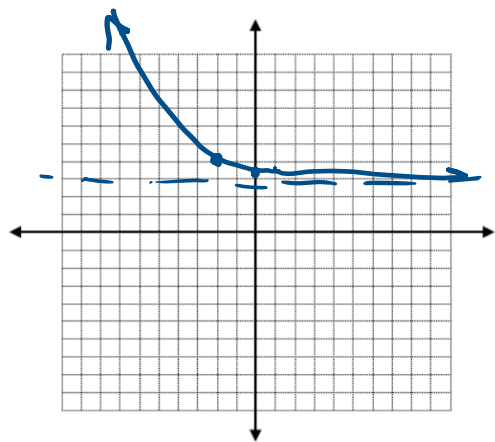
3. $y = \frac{1}{2}(2)^{x-1} - 4$

HA: $y = -4$
 y-int: $(0, -3.75)$
 $(1, -3.5)$



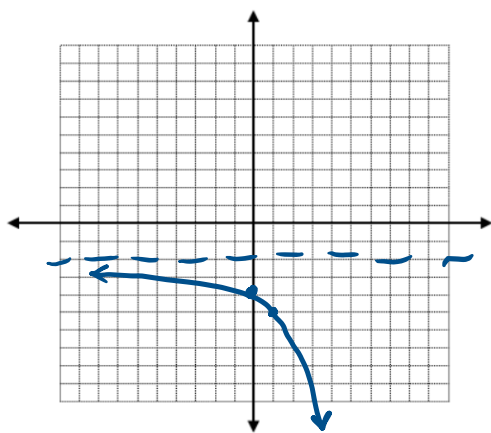
4. $y = \left(\frac{1}{2}\right)^{x+2} + 3$

HA: $y = 3$
 y-int: $(0, 3.25)$
 $(-2, 4)$



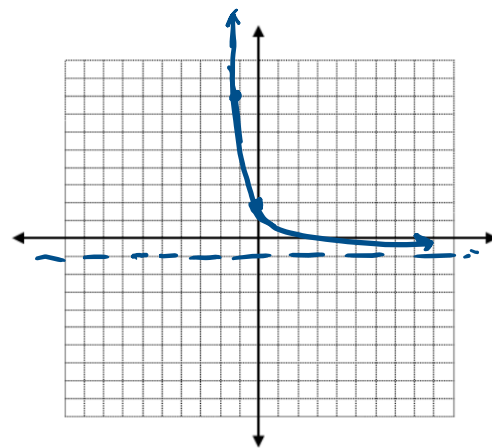
5. $y = -3\left(\frac{2}{3}\right)^{x+1} - 2$

HA: $y = -2$
 y-int: $(0, -4)$
 $(-1, -5)$



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

HA: $y = -1$
 y-int: $(0, 2)$
 $(-1, 8)$



Graphing Log Functions

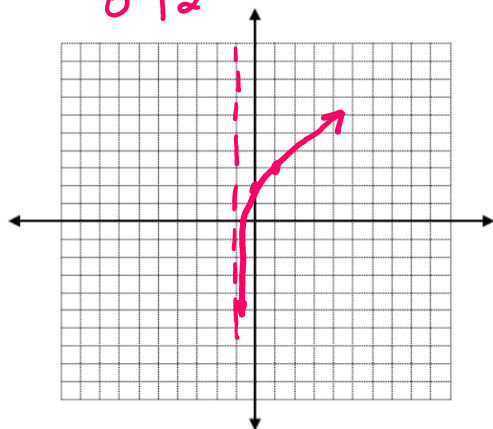
9. $y = \log_2(x+1) + 2$

PG: $\log_2 x$

T: up 2, left 1

VA: $x = -1$

x	y
1	3
0	2



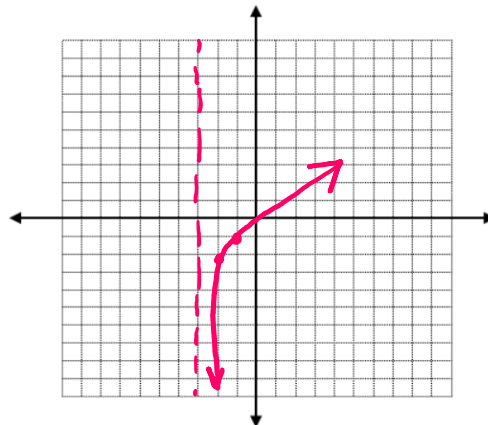
10. $y = \log_2(x+3) - 2$

PG: $y = \log_2 x$

T: down 2, left 3

VA: $x = -3$

x	y
-1	-1
-2	-2



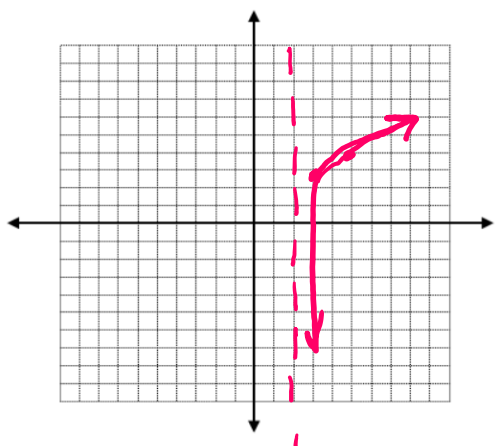
11. $y = \log_3(x-2) + 3$

PG: $y = \log_3 x$

T: up 3, right 2

VA: $x = 2$

x	y
5	4
3	3



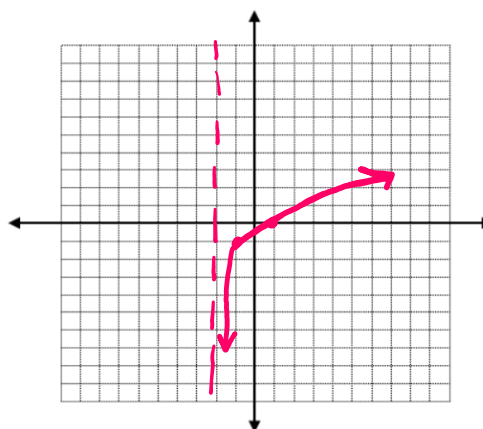
12. $y = -1 + \log_3(x+2)$

PG: $y = \log_3 x$

T: down 1, left 2

VA: $x = -2$

x	y
1	0
-1	-1



Equations: $y = a(1-r)^t$ $y = a(1+r)^t$ $A = P(1 + \frac{r}{n})^{nt}$ $A = Pe^{rt}$

13.) A substance decays 22% each day. After 7 days, there are 9 milligrams of the substance remaining. How many milligrams were there initially?

$$r = 0.22 \quad t = 7 \quad y = 9 \quad a = ?$$

$$9 = a(1 - 0.22)^7$$

$$9 = a(0.78)^7$$

$$a = 51.2$$

$$\boxed{51.2 \text{ mg}}$$

14.) Sam opened a bank account with an interest rate of 4.8% that is compounded annually. He invested \$3,890 in the account in 1999 but had to make a withdrawal from his account in 2007 in the amount of \$2,300 with no penalty. How much money is in his account now, in 2016?

$$A = 3890 \left(1 + \frac{0.048}{1}\right)^{1(8)} \leftarrow 2007$$

$$= 5660.31$$

$$- 2300$$

$$\hline 3360.31$$

$$\boxed{\$5124.26}$$

15.) The number n of college graduates in thousands after t years can be modeled by $n = 46 \log_5(t + 3)$. Let $t = 0$ represent 1985. (a) How many college graduates were there in 2003? (b) How long until there are 123,000 college graduates? When will this occur?

(a) $t = 18$

$$n = 46 \log_5(18 + 3)$$

$$\approx 93 \text{ thousand}$$

(b) $123 = 46 \log_5(t + 3)$

$$2.67 = \log_5(5t + 40)$$

$$46 \cdot 7.74 = 5t + 40$$

$$t = 86 \text{ years later}$$

16.) In 1990, the population of New York State was 7.99 million. The population grows at a rate of 2.3%. When will New York's population reach 15 million people?

$$A = Pe^{rt} \quad 15 = 7.99e^{0.023t}$$

$$1.88 = e^{0.023t}$$

$$\ln 1.88 = 0.023t$$

$$t = 27 \text{ years}$$

17.) You have \$1000 that you want to invest for 5 years before you use the money towards a large purchase. Your bank offers a compound interest rate of 3% compounded monthly or an annual compound interest rate of 4.7%. Assuming that you will leave the money in for 5 years, what is the best way to invest with your bank?

$$A = 1000 \left(1 + \frac{0.03}{12}\right)^{12(5)}$$

$$\$1116.62$$

OR $A = 1000 \left(1 + \frac{0.047}{1}\right)^{1(5)}$

$$\$1258.15$$

2nd option!