

Exponential Functions - NOTES

Evaluate each function.

1) $g(a) = 3 \cdot 3^a$; Find $g(0)$

$$\begin{aligned} g(0) &= 3 * 3^0 \\ &= 3 * 1 \\ &= \boxed{3} \end{aligned}$$

2) $g(a) = 2^a$; Find $g(1)$

$$\begin{aligned} g(1) &= 2^1 \\ &= \boxed{2} \end{aligned}$$

3) $h(n) = 2^{n-2}$; Find $h(2)$

$$\begin{aligned} h(2) &= 2^{2-2} \\ &= 2^0 \\ &= \boxed{1} \end{aligned}$$

4) $k(a) = 5^{a+1}$; Find $k(-1)$

$$\begin{aligned} k(-1) &= 5^{-1+1} \\ &= 5^0 \\ &= \boxed{1} \end{aligned}$$

5) $h(a) = -2 \cdot 2^{-a}$; Find $h(-4-a)$

$$\begin{aligned} h(-4-a) &= -2 * 2^{-(4+a)} \\ &= \boxed{-2 * 2^{(4+a)}} \end{aligned}$$

6) $h(x) = -3 \cdot 3^{x-1}$; Find $h(x-4)$

$$\begin{aligned} h(x-4) &= -3 * 3^{(x-4)-1} \\ &= \boxed{-3 * 3^{(x-5)}} \end{aligned}$$

7) $p(n) = -3^{3n} - 1$; Find $p(n^2)$

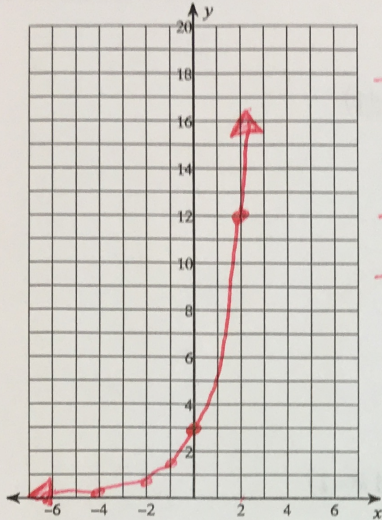
$$\begin{aligned} p(n^2) &= -3^{3(n^2)} - 1 \\ &= \boxed{-3^{3n^2} - 1} \end{aligned}$$

8) $f(a) = 2 \cdot 5^{2a-2} + 3$; Find $f\left(\frac{a}{4}\right)$

$$\begin{aligned} f\left(\frac{a}{4}\right) &= 2 * 5^{2\left(\frac{a}{4}\right)-2} + 3 \\ &= \boxed{2 * 5^{\frac{a}{2}-2} + 3} \end{aligned}$$

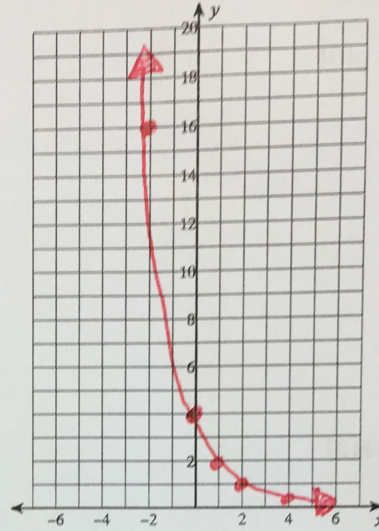
Sketch the graph of each function.

9) $f(x) = 3 \cdot 2^x$



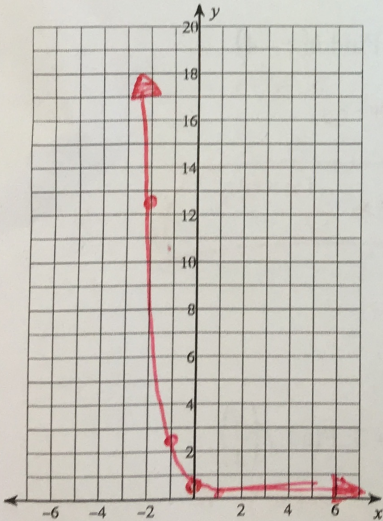
x	y
0	3
-1	1.5
-2	0.75
-4	0.188
2	12

10) $f(x) = 4 \cdot \left(\frac{1}{2}\right)^x$



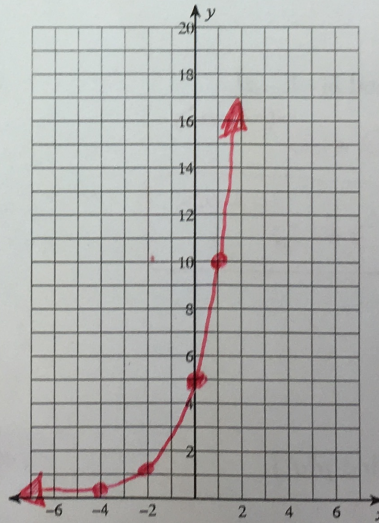
x	y
0	4
1	2
2	1
4	0.25
-2	16

11) $f(x) = \frac{1}{2} \cdot \left(\frac{1}{5}\right)^x$



x	y
0	1/2
-1	2.5
-2	12.5
1	0.1

12) $f(x) = 5 \cdot 2^x$



x	y
0	5
-2	1.25
-4	0.313
1	10

13) Simple Interest Formula:

$$A = P(1 + rt)$$

P = PRINCIPAL

r = INTEREST RATE (IN DECIMAL)

t = TIME (# OF YEARS)

Use simple interest to find the ending balance.

14) \$540 at 7% for 5 years

$$\begin{aligned} A &= 540(1 + .07 * 5) \\ &= 540(1 + .35) \\ &= 540(1.35) \\ &= \boxed{729} \end{aligned}$$

15) \$365 at 12.9% for $\frac{3}{4}$ years

$$\begin{aligned} A &= 365(1 + .129 * .75) \\ &= 365(1 + .09675) \\ &= 365(1.09675) \\ &= 400.31375 \\ &= \boxed{400.31} \end{aligned}$$

16) Compound Interest Formula:

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

P = PRINCIPAL

r = INTEREST RATE

n = # OF TIMES PER YEAR

t = TIME (# OF YEARS)

Find the total value of the investment after the time given.

17) \$9,000 at 11% compounded semiannually for 2 years

$$\begin{aligned} A &= 9000 \left(1 + \frac{.11}{2} \right)^{2 * 2} \\ A &= 9000(1 + .055)^4 \\ A &= 9000(1.055)^4 \\ A &= 9000(1.24) \\ A &= \boxed{1114.94} \end{aligned}$$

18) \$1,870 at 7.8% compounded quarterly for $\frac{1}{4}$ years

$$\begin{aligned} A &= 1870 \left(1 + \frac{.078}{4} \right)^{4 * \frac{1}{4}} \\ &= 1870(1 + .0195)^1 \\ &= 1870(1.0195) \\ &= 1906.465 \\ &= \boxed{1906.47} \end{aligned}$$