1. Let $a > 0$, $b > 0$ and x and y are any real numbers. Fill out the table of **Laws of Exponents** below:

1.	$b^{x+y} =$ $b^x \cdot b^y$	**3.**	$(b^x)^y =$ b^{xy}
2.	$b^{x-y} =$ b^x / b^y	**4.**	$(ab)^x =$ $a^x b^x$

2. Use the the table above to rewrite and simplify the expression. Write down the number of the rule that you are using to the side of your work.

a. $\sqrt[3]{x^{-2}} = x^{-2/3}$

b. $b^{(n-1)}(3b^2)^n =$
$= b^{n-1} \cdot 3^n \cdot b^{2n}$
$= 3^n \cdot b^{2n+n-1}$
$= 3^n \cdot b^{3n-1}$

c. $\frac{6x^2y}{\sqrt{4xy^3}} = 6x^2y \cdot (4xy^3)^{-\frac{1}{2}} =$
$= 6x^2y \cdot \frac{1}{2} \cdot x^{-\frac{1}{2}} \cdot y^{-3/2}$
$= 3 \cdot x^{3/2} \cdot y^{-\frac{1}{2}}$

3. Are the following statements true or false? If the statement is false, provide a counterexample (using specific numbers) showing it is false.

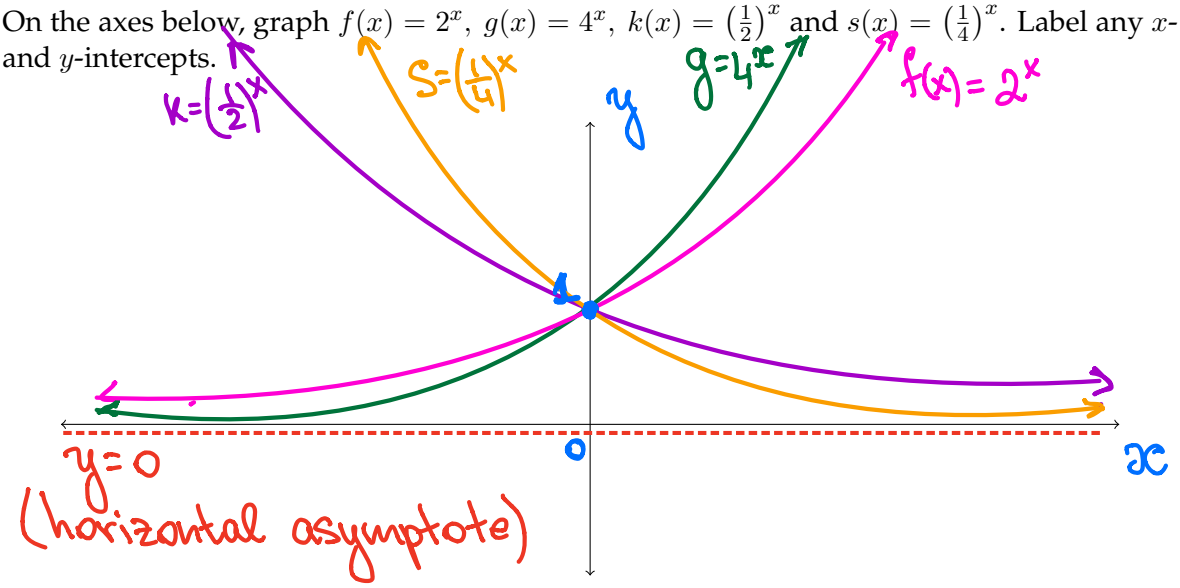
a. $(a+b)^2 = a^2 + b^2$ False. $(a+b)^2 = a^2 + 2ab + b^2 \neq a^2 + b^2$

b. $\sqrt{x^2+4} = x+2$ False. This rule is illegal for $\sqrt{\ }$

c. $\frac{a+b}{c+d} = \frac{a}{c} + \frac{b}{d}$ False. This rule is illegal for rational functions

d. $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$ True.

4. On the axes below, graph $f(x) = 2^x$, $g(x) = 4^x$, $k(x) = \left(\frac{1}{2}\right)^x$ and $s(x) = \left(\frac{1}{4}\right)^x$. Label any x- and y-intercepts.



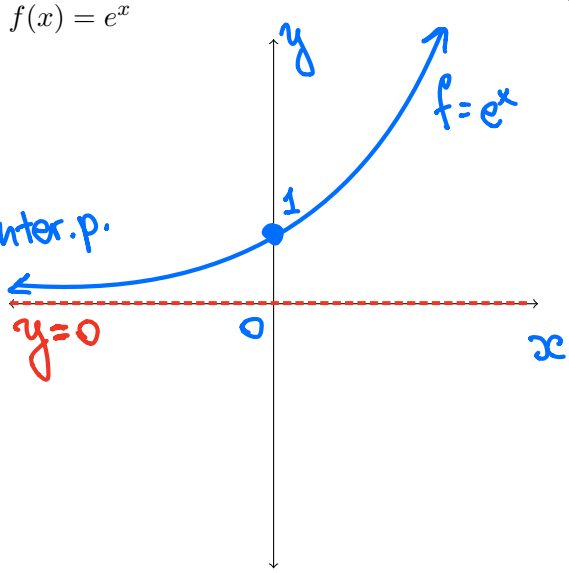
5. What is the domain and range of $f(x) = 4^x$? Horizontal and vertical asymptotes?

Dom(f(x)) = ℝ

y=0 is a horizontal asymptote. No vertical asymptotes

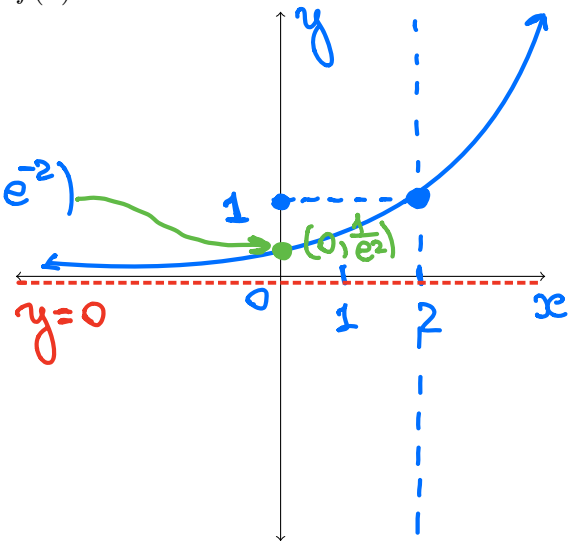
6. Sketch the graph of each function below, using what you know about transformations of functions. Determine its domain and range, and label any x- and y-intercepts (use exact numbers) and horizontal or vertical asymptotes.

(a) $f(x) = e^x$



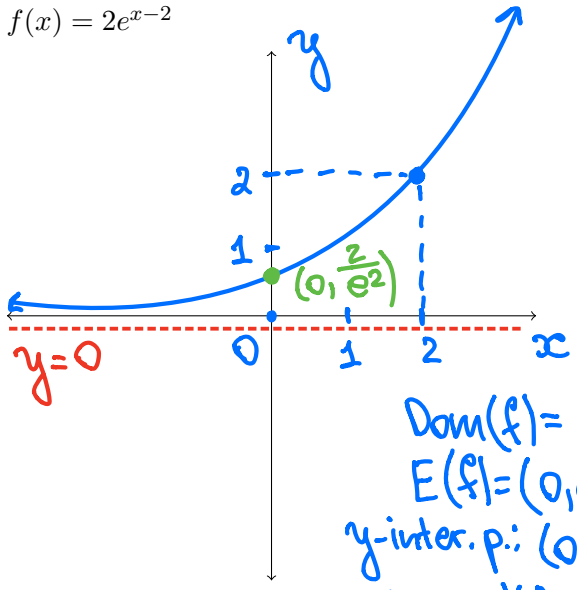
Dom(f)=ℝ
E(f)=(0,∞)
(0,1) is a y-inter.p.
y=0 : HA

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



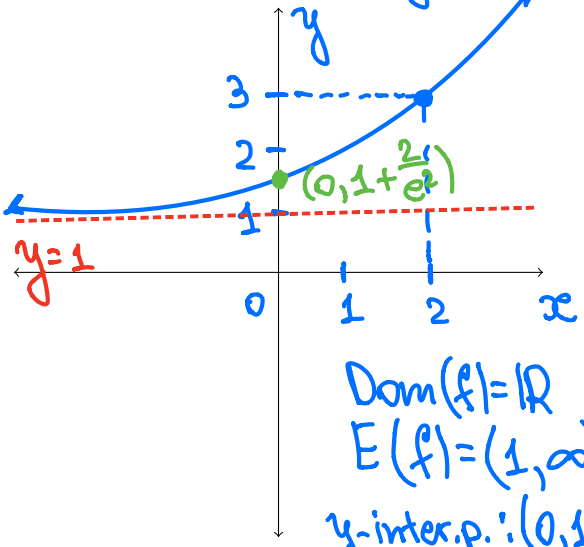
Dom(f)=ℝ
E(f)=(0,∞)
y-inter.p.: (0, e^{-2})
y=0 : HA

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



Dom(f)=ℝ
E(f)=(0,∞)
y-inter.p.: (0, 2/e²)
y=0 : HA

(d) $f(x) = 1 + 2e^{x-2}$



Dom(f)=ℝ
E(f)=(1,∞)
y-inter.p.: (0, 1+2/e²)
y=1 : HA

HA (horizontal asymptote)