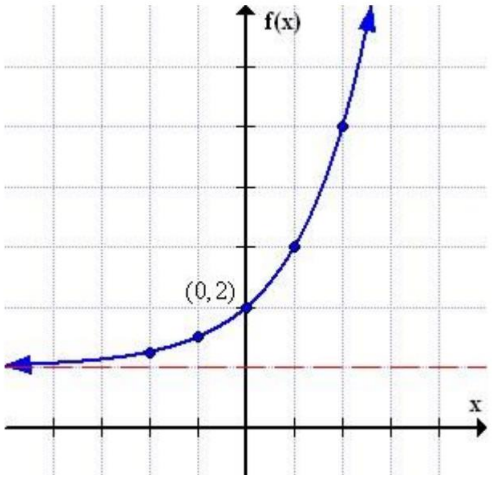
Graph each function and find $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$.

1a) $f(x) = 2^x + 1$

1b) $f(x) = \left(\frac{2}{3}\right)^x - 2$

1c) $f(x) = 2^{x-1} - 2$



$\lim_{x\to\infty} f(x) = +\infty$

$\lim_{x\to-\infty} f(x) = 1$

2a) Teresa was late getting ready for a party, and the liters of soft drinks she bought were still at room temperature (73° F) with guests due to arrive in 15 minutes. If she puts these in her freezer at –10° F, will the drinks be cold enough (35°F) for her guests? Note: She check the temperature of the drinks after 5 minutes in the freezer and the temperature had dropped to 61° F.

Let x = time and y = Temperature

$y = ab^x - 10$

$y = 83b^x - 10$ (because initial Temp. = 73)

$61 = 83b^5 - 10$ (because Temp. = 61 after 5 min.)

$b \approx .96925$

$y = 83(.96925)^x - 10$

So, $y = 42$ when $x = 15$

Therefore, NO they will not be cold enough as they are only down to 42°F at that time!

2b) A thermometer is taken from a room at 72^{o} F to the outdoors where the temperature is 20^{o} F. Determine the reading on the thermometer after 5 minutes if the reading drops to 48^{o} F after one minute.

2c) A new car purchased for $25,000 decreases exponentially at 25% annually. What is the value of the car after 10 years?

2d) Krypton-85 has a half-life of 10.76 years. How much of a sample of 60 g is remaining after 50 years?