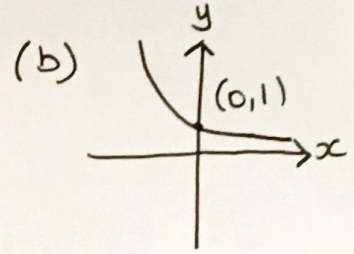
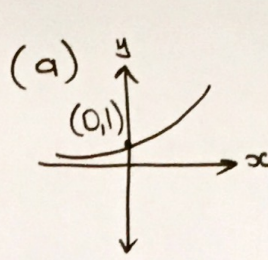


Exponential Functions and Graphs

(a) Sketch the graph of $y = 2^x$, marking the coordinates of any points that cross the axes.

(b) Sketch the graph of $y = 0.5^x$, marking the coordinates of any points that cross the axes.



The exponential growth of a bat population can be described by the equation $P = 20 \times 1.2^t$, where P is the population at time t in months.

(a) What is the initial bat population?

(b) Calculate the population of bats after 6 months.

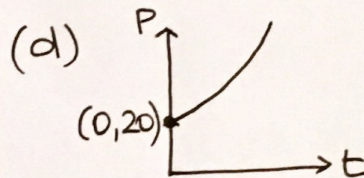
(c) What is the percentage increase in the bat population per month?

(d) Sketch the graph of the bat population over time, marking the coordinates of any points where the graph crosses the axes.

(a) 20

(b) $20 \times 1.2^6 = 59.7 \Rightarrow 59$

(c) 20%



A radioactive element decays according to the equation $m = 500 \times 0.5^t$ where m is the mass of the element in kg and t is the time in days.

(a) What is the initial mass of the radioactive element?

(b) What is the mass of the element after 2 days?

(c) What is the mass of the element after 15 days? Give your answer in grams to 1 decimal place.

(d) What is the half-life of the element? The half-life is the time it takes to decay to half its original mass.

(e) Sketch the graph of the mass against time.

(a) 500 kg

(b) 125 kg

(c) 15.3 g

(d) 1 day

