

4.15 PreExam: Exponential Functions

Construct an exponential function symbolically given a description of the relationship F.LE.2.ii

1. A colony of insects grows exponentially with a growth factor of 3 each day. By what growth factor does the population change each 12 hours? Express your answer two ways: as a radical and a fractional exponent.

2. A bacteria population, in thousands, is represented by the function $B(t) = 100 \times 1.15^t$, where t is the time in hours.
 - (a) What is the initial number of bacteria?

 - (b) What is the growth factor per hour?

 - (c) What is the growth factor for ten hours?

 - (d) What is the population after 10 hours?

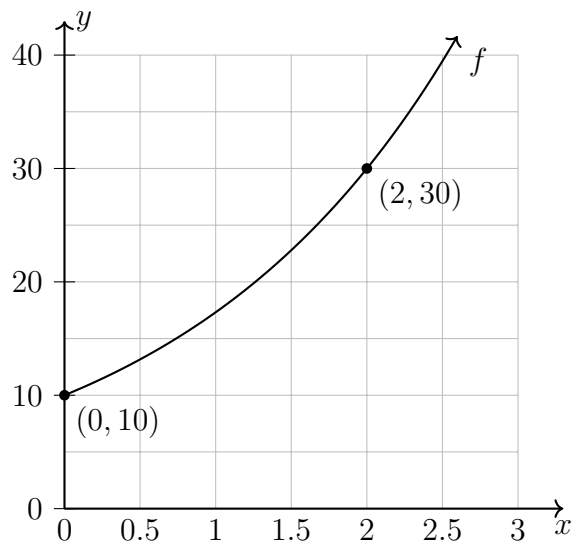
3. An investment of \$1,000 doubles in value after 6 years. Write an exponential function $V(t)$ to model the investment value, with t in years. Express your answer two ways: as a radical and a fractional exponent.

4. The graph shows the exponential function $f(x)$.

(a) Write down the initial value of the function.

(b) By what factor do the values of f increase each time x increases by 1?

(c) Write an expression for the function $f(x)$.



5. A sample of radioactive material has a half-life of 8 years. Initially there are 7.5 grams of the material.

(a) How much of the material remains after 8 years?

(b) How much of the material remains after 4 years?

(c) Write an exponential function $A(t)$ to model the amount of material remaining, with t in years.