

#### 4.15 PreExam: Exponential Functions

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

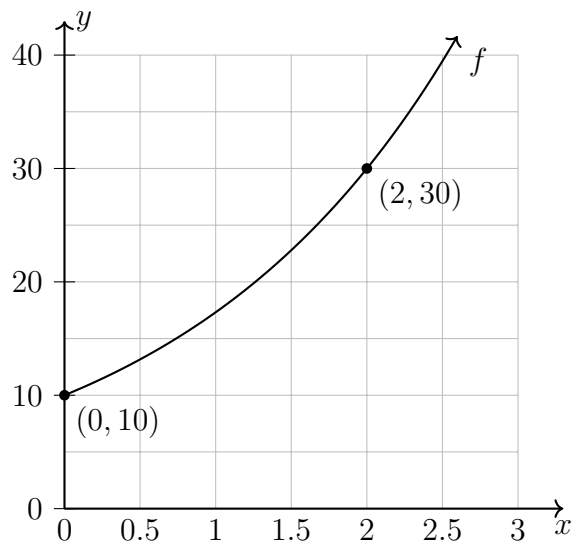
1. A colony of insects grows exponentially with a growth factor of 3 each day. By what growth factor does the population change each 12 hours? Express your answer two ways: as a radical and a fractional exponent.
  
  
  
  
  
  
  
  
  
  
2. A bacteria population, in thousands, is represented by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