

Quiz 4

1. Convert 10 centimeters per second into inches per hour using 1 inch = 2.5 centimeters. (Hint: Treat this as two separate problems. First convert centimeters per second to inches per second. Next, convert that answer to inches per hour.)

$$10 \frac{cm}{sec} \cdot \frac{1in.}{2.5cm} = \frac{10}{2.5} \frac{in.}{sec} = 4 \frac{in.}{sec}$$

$$4 \frac{in.}{sec} \cdot \frac{60sec}{1min.} \cdot \frac{60min.}{1hour} = 4 \cdot 60 \cdot 60 \frac{in.}{hour} = 14,400 \frac{in.}{hour}$$

2. You have an initial population of 10 cells. The population triples every minute.

a. Model population as a function of time (in minutes).

$$f(x) = 10 \cdot 3^x$$

b. What will the population be after 3 minutes?

$$f(3) = 10 \cdot 3^3 = 270$$

c. Set up but do not solve an equation to determine the number of minutes required for the population to grow to 5000 cells.

$$5000 = 10 \cdot 3^x$$

3. Find an exponential function through the points (0, 4) and (2, 100).

$$f(x) = Ca^x$$

The initial value C is the output when $x = 0$, so

$$f(x) = 4a^x$$

To find a , plug in another point and solve.

$$100 = 4a^2$$

$$25 = a^2$$

$$5 = a$$

So

$$f(x) = 4 \cdot 5^x.$$