**Exponential Functions Word Problems 1** **Name:**
*Algebra 1*

1) The population of wolves in an area is represented by the equation $p(t) = 800(0.95)^t$ where t is the number of years since the year 2000.

a) In the above equation what does 800 represent?

b) In the above equation what does 0.95 represent?

c) Predict the number of wolves in the year 2012.

2) The height of a bouncing ball (measured in inches) after x bounces is represented by the equation $f(x) = 120(0.75)^x$.

a) About how many high does the ball bounce after the first bounce?

b) About how many high does the ball bounce after the fifth bounce?

c) How many bounces will it take for the ball to reach no higher that 1 inch?

3) Look at the equations below. Which of them is NOT exponential? (Cross it out!) For the exponential equations, which model growth and which model decay?

a) $y = 10(2)^x$ b) $f(x) = 20(.5)^x$ c) $g(x) = 3^{x+1}$

d) $y = \frac{1}{2}(3)^x$ e) $y = 10(x)^2$ f) $y = 100(\frac{3}{2})^x$

g) $f = 6(\frac{1}{3})^x$ h) $y = 620{,}000(1.002)^x$ i) $y = 100(0.9)^x$

4) Since January 1980, the population of the city of Brownville has grown according to the mathematical model $y = 720{,}500(1.022)^x$ , where $x$ is the number of years since January 1980.

a) Explain what the numbers 720,500 and 1.022 represent in this model.

b) What would the population be in 2000 if the growth continues at the same rate.

c) If this trend continues, use this model to predict the when the population of Brownville will reach 1,000,000. (Round to the nearest tenth of a year.)

5) After an oven is turned on, its temperature, $T$, is represented by the equation $T = 400 - 350(3.2)^{-0.1m}$, where $m$ represents the number of minutes after the oven is turned on and T represents the temperature of the oven, in degrees Fahrenheit.

a) What is the temperature of the oven after 5 minutes? (Round to the nearest degree.)

b) How many minutes does it take for the oven's temperature to reach 300°F? (Round answer to the *nearest minute*.)