3. The following data shows the temperature F in °F at time t in hours after a corpse was discovered.

t	F
0	80
1.1	70
2.3	58
3.8	48
4.9	41
7.1	29
9.2	23

a. Does a linear, sine, or exponential function best fit the data?

Exponential

b. Rounding to the nearest thousandth, write your model below.

$F(t) = 80.427(0.871)^t$

c. If the person's temperature was 98.6°F at the time of death, for how many hours had he been dead at the time of discovery? Round to the nearest tenth.

Y2 = 98.6

(2nd, Trace, Intersect) X = -1.5 Y = 98.6

⇒ The person had been dead for 1.5 hours

d. What will the corpse's temperature be 10 hours after the time of discovery?

Table:

X	Y
10	20.1

The corpse will be 20.1°F 10 hours later.

e. The ambient temperature is 0°F. What is the practical domain in the context of this problem? The practical range?

Domain: $-1.5 \leq t$

Range: $0 < F \leq 98.6$

f. What is the theoretical domain of the F(t) function? The theoretical range?

Domain: $\mathbb{R}$

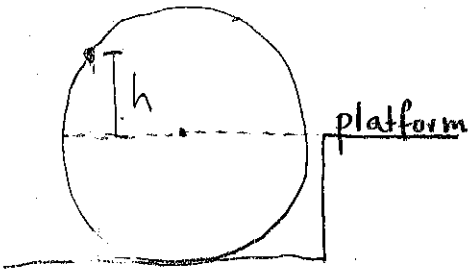
Range: $F > 0$

Where you should go for more review on this concept: Look at your Exponentials Quiz and Exponentials Quiz Review. See post online from 11/13/12 for the key to that review. Google or search in khanacademy.org for "exponential decay."

4. The following data shows the height h in feet of a person on a Ferris at the time t in minutes that she boarded the Ferris wheel from a platform. The platform is at the same height as the center of the wheel.

t	h
0.1	3.1
0.4	12.1
0.8	21.2
1.3	24.8
1.7	21.1
2.2	9.2
2.6	-3.1
3.0	-14.7
3.6	-24.6
4.5	-14.7
4.8	-6.2

a. Draw a diagram of the Ferris wheel and rider. Label the height h.



← negative height means she is below the platform

b. Does a sine, power, or logarithmic (LnReg) function best fit the data?

Sine

c. Rounding to the nearest thousandth, write your model below.

$H(t) = 24.994\sin(1.256x + 9.857) - .005$

d. At what height will the rider be after 12 minutes on the ride?

Table:

X	Y
12	14.7

She will be 14.7 feet above the platform after 12 minutes.

e. What is the radius of the wheel? Where can you get this information in the equation?

24.994 ft. This is the amplitude of the sine curve.

f. What is the practical domain in the context of this problem? The practical range?

Domain: $0 \leq t \leq$ when she gets off the ride.

Range: $-24.994 \leq h \leq 24.994$

g. What is the theoretical domain of the h(t) function? The theoretical range?

Domain: $\mathbb{R}$

Range: $-24.994 \leq h \leq 24.994$

Where you should go for more review on this concept: Look at the Swing Lab (see 2/27/13 post). Go over the Sine and Cosine Functions Quiz and Quiz Review. See post online from 3/11/13 for the key to that review. Google "Ferris wheel word problems."