5-102.

a. 1.03

b. 0.75

c. 0.87

d. 1.0208

5-103.

a. #1 is arithmetic, #2 is neither, #3 is geometric

b. #1 the generator is to add -3, #3 the generator is to multiply by $\frac{1}{2}$

5-104.

$y = -\frac{1}{3}x + 2$

5-105.

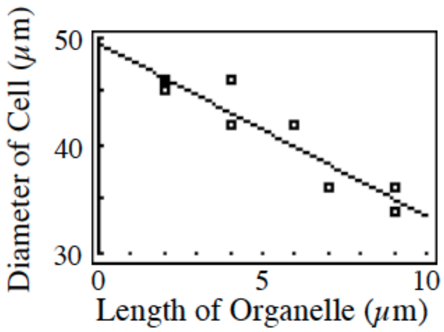
a. $x = 2$

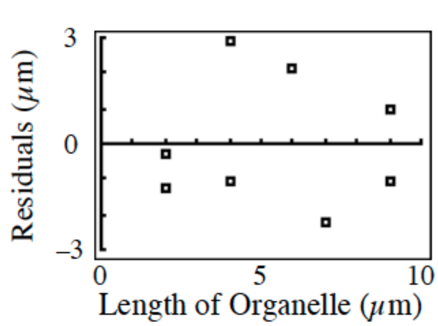
b. undo, then look inside; $x = 25$

5-106.

a. Create a scatterplot; compute and draw the $LSRL$; verify linearity with a residual plot; describe form, direction (including the slope and y-intercept in context), strength (including an interpretation of r and R^2), and possible outliers; draw upper and lower bounds to the model used for prediction.

b. See graphs below. $y = 49.50 – 1.60x$. The linear model is appropriate because the residual plot shows no apparent pattern. The slope is -1.60meaning that an increase of 1 µm in the length of the organelle is expected to decrease the diameter of the cell by 1.60 µm. The y-intercept of 49.50 means that a cell with no organelle has a length of 49.50 µm; this is possible even though it is an extrapolation. The correlation coefficient is $r = –0.928$ and $R^2 = 86.1$%, so 86.1 percent of the variability in the diameter of the overall cell can be explained by a linear relationship with the length of the organelle. There are no apparent outliers. The upper bound can be given by $y = 52.42 – 1.60x$ and the lower bound by $y = 46.58 – 1.60x$.





5-107.

Technically, Mathias can never leave, either because he will never reach the door or because he cannot avoid breaking the rules. The equation for this situation is $y = 100(0.5)^x$, where x is the number of minutes that have passed and y is the distance (in meters) from the door.

5-108.

112.5 minutes or 1 hour 52 minutes, $5\frac{1}{3}$ miles per hour

5-109.

a. Sequence 1: $10, 14, 18, 22$, add 4, $t(n) = 4n - 2$
Sequence 2: $0, -12, -24, -36$, subtract 12, $t(n) = -12n + 36$
Sequence 3: 9, 13, 17, 21, add 4, $t(n) = 4n - 3$

b. Yes, Sequence 1: $18, 54, 162, 486$, multiply by 3, $t(n) = \frac{2}{3}(3)^n$
Sequence 2: $6, 3, 1.5, 0.75$, multiply by $\frac{1}{2}$, $t(n) = 48(\frac{1}{2})^n$
Sequence 3: $25, 125, 625, 3125$, multiply by 5, $t(n) = \frac{1}{5}(5)^n(5)^n$

c. Answers vary, but the point is to have students create their own equation and write terms that correspond to it.

5-110.

a. $x = -\frac{16}{5}$

b. no solution

c. $x = 2$

d. $x = -1$

5-111.

$y=\frac{2}{3}x-3$

5-112.

a. -1

b. 2

c. undefined

d. -1.8

5-113.

a. $7^2=49$ sq cm

b. $0.5(10)4=20$ sq in

c. $0.5(16+8)6=72$ sq ft