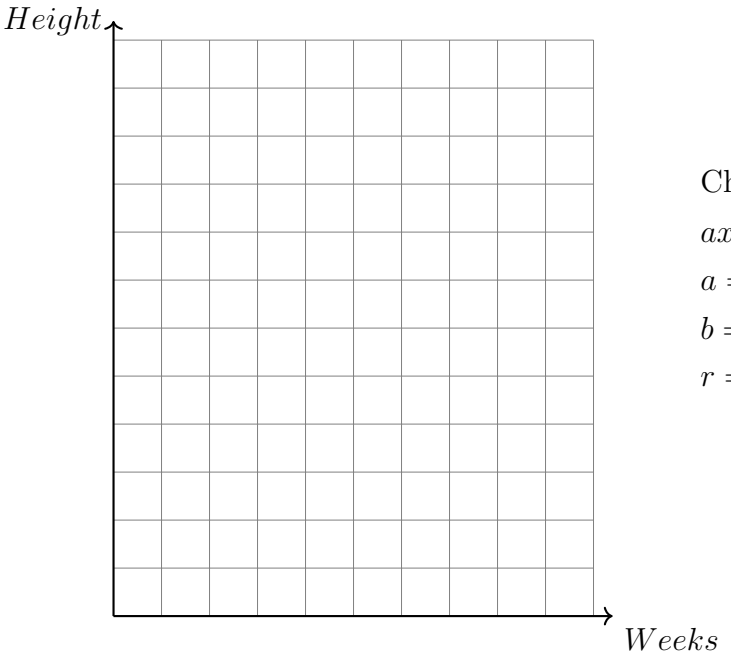
La Scuola d'Italia / Huson / IB Math: Sequences First & last name:
31 October 2025 Grade:

2.3 Classwork: Review; due Monday 3 November

1. Dr. Huson buys a new plant and measures how tall it is after a number of weeks. Some of his measurements are shown below. Plot the points in the grid below.

Weeks	2	5	7	10
Height (cm)	5	6	8	9



Check your calculator
$ax + b$
$a = 0.592$
$b = 3.82$
$r = 0.972$

(a) State, rounding the coefficients to *three significant figures*, the linear regression equation that approximates the height, y, of the plants after x weeks.

(b) Explain what the y-intercept means in the context of the problem.

(c) Explain what the slope means in the context of the problem.

(d) Find the correlation coefficient, r. "Characterize" the correlation between the two variables.

(e) Using the regression model, predict the height of the plant after 6 weeks.

2. Given that for a geometric sequence $u_1 = 54$ and $u_4 = 16$
   (a) Find the value of r.
   (b) Given that u_k is the first term of the sequence with a value less than one, find k.
   (c) Find the sum of the infinite series S_∞

3. The first three terms of an arithmetic sequence are $u_1 = 7.1$, $u_2 = 7.4$, and $u_3 = 7.7$.
   (a) Find the common difference.
   (b) Given that the kth term of the sequence, $u_k = 11$. Find k.

4. Let $x = \ln 3$ and $y = \ln 7$. Write down the following expressions in terms of x and y.
   (a) $\ln \frac{7}{3}$
   (b) $\ln 63$
   (c) $\ln 9$

5. Let $f(x) = x^2 - 8x + 3$
   (a) Rewrite quadratic in vertex form and state the vertex as an ordered pair.
   (b) The parabola is translated vertically by k units to make the function $g(x)$. The equation $g(x) = 0$ has one solution. Find k.

6. The function g is defined by graph of $y = g(x)$ below.
   (a) Write down the equation for $g(x)$ in factored form.
   (b) The function $h(x)$ is made by reflecting g across the x-axis. What is the equation for $h(x)$?