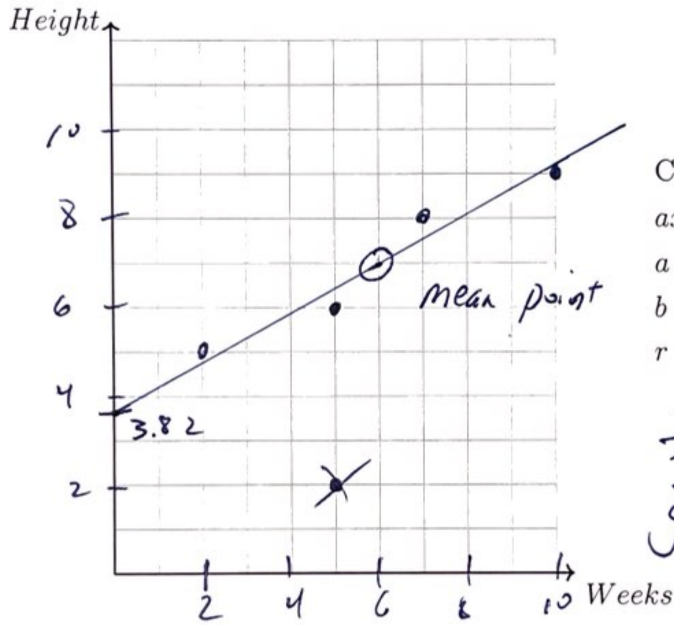
La Scuola d'Italia / Huson / IB Math: Sequences
31 October 2025

First & last name: SOLUTIONS
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

$ax + b$

$a = 0.5\cancel{92}$ .529

$b = 3.82$

$r = 0.97\cancel{6}$

$\bar{x} = 6$

$\bar{y} = 7$

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

height $y = 0.529x + 3.82$

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

3.82 cm is the height of the plant at time zero (when it was bought)

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

slope $0.529 \frac{\text{cm}}{\text{week}}$ is the growth rate

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

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

$$f(6) = 0.529(6) + 3.82$$
$$= 6.994 \approx 6.99 \text{ cm}$$

IB Math

2.3 Review

Solutions

2. $u_1 = 54 \quad u_4 = 16$

(a) $u_4 = 54\, r^{(4-1)} = 16$

$r^3 = \frac{16}{54} = \frac{8}{27}$

$r = 2/3$

(b) $u_k = 54\left(\frac{2}{3}\right)^{k-1} < 1$

$\left(\frac{2}{3}\right)^{k-1} < 1/54$

$k-1 = \log_{2/3}(1/54) > 9.838\ldots$

$k = 11$

check : $u_{11} = 54\left(\frac{2}{3}\right)^{(11-1)} = 0.9364\ldots \qquad u_{10} = 1.404\ldots$

(c) $S_\infty = 54\left(\frac{1}{1 - 2/3}\right) = 162$

3. arithmetic: 7.1, 7.4, 7.7

(a) $d = 7.4 - 7.1 = 0.3$

(b) $u_k = 7.1 + 0.3(k-1) = 11$

$k = 14$

4. $x = \ln 3, \quad y = \ln 7$

(a) $\ln 7/3 = y - x$

(b) $\ln 63 = 2x + y$

(c) $\ln 9 = 2x$

2.3 Review

Solutions

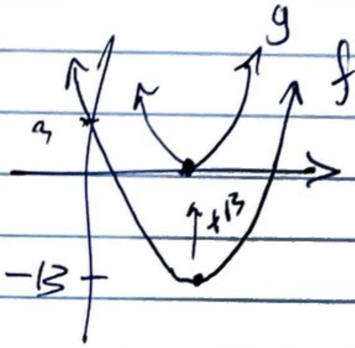
5. $f(x) = x^2 - 8x + 3$

(a) $y = x^2 - 8x + 16 - 13$

$= (x-4)^2 \cancel{+16} - 13$

Vertex $(4, -13)$

(b) $k = 13$



6. a) $g(x) = (x-2)^2$

b) $h(x) = -(x-2)^2$