

The following table shows the age in days (x) and length of new-born babies in cm (y).

age in days (x)	1	10	30	50	60	80	100
length in m (y)	50	52	56	58.5	59	60	63

The relationship between the variables is modelled by the regression line with equation $y = ax + b$

- Find the values of a and b
- Write down the correlation coefficient
- Use your equation to estimate the length of a baby that is 40 days old
- Use your equation to estimate the length of a baby that is 150 days old
- Use your equation to estimate the age of a child that is 54 cm long.

a) $y = 0.124x + 51.1$

b) $r = 0.976$

c) $y = 0.1238x + 51.08$

$$y = 0.1238 \times 40 + 51.08$$

$$y = 56.0$$

- d) 150 days lies outside the interval of data. This is extrapolation.

We cannot reliably make this type of prediction.

- e) For this question, we are asked to make an x prediction from a y value. We should not do this with the y on x regression line. In fact, y is the dependent variable (height is dependent on age), therefore, we should not use an x on y regression line.

We cannot reliably make this type of prediction.