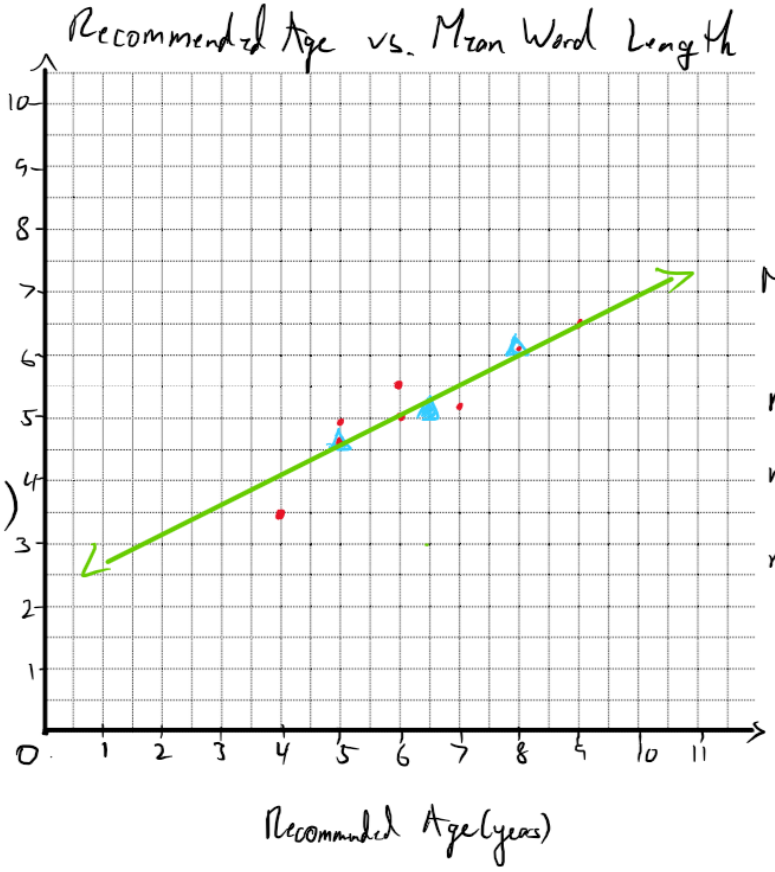
1.



2. a)

Sort data: ① ② ③

Recommended Age: 4, 5, 5, | 6, 7, | 6, 8, 9

Mean Word Length: 3.5, 4.6, 4.9, | 5.0, 5.2, | 5.5, 6.1, 6.5

$med_{1,y} = 4.6$ $\quad med_{1,x} = 5$

$med_{2,y} = \frac{5.0+5.2}{2} = 5.1$ $\quad med_{2,x} = \frac{6+7}{2} = 6.5$

$med_{3,y} = 6.1$ $\quad med_{3,x} = 8$

∴ medians are (5, 4.6), (6.5, 5.1), (8, 6.1)
(drawn as △)

b)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Choose: $(5, 4.6), (8, 6.1)$

$$m = \frac{6.1 - 4.6}{8 - 5}$$

$$= \frac{1.5}{3}$$

$$= \frac{1}{2}$$

Sub $m = \frac{1}{2}$, $(5, 4.6)$

$y = \frac{1}{2}x + b$

$4.6 = \frac{1}{2}(5) + b$

$b = 2.1$

∴ The equation of the median-median line is $y = \frac{1}{2}x + 2.1$

3.

Sub $x = 17$:

$y = \frac{1}{2}x + 2.1$

$y = \frac{1}{2}(17) + 2.1$

$= 10.6$

∴ The mean word length for someone my age (17 y.o.) is 10.6 letters.

This prediction is <u>not</u> accurate since the majority of words in books that are targetted towards 17 year-olds are not typically more than 10 letters long. This suggests that the mean-word length plateaus or the slope of the line is gradually reduced for larger values of the recommended age.

4.

Find mean word length of the passage.

It was a lazy sort of day in Bear Country. The air was so still that the leaves on the big tree house where the Bear family lived were hardly rustling. Except in the beehive, where the bees were always busy, nothing much seemed to be happening. It was the sort of day that sometimes leads to mischief.

$$\text{Mean word length} = \frac{\sum \text{word length}}{\#\text{ of words}}$$

$$= \frac{\begin{aligned}&2+3+1+4+4+2+3+2+4+7+3+3+3+2+5+4+3+6+2+3+3+4+5+5+3+4+6+5\\&+4+6+8+6+2+3+7+5+3+4+4+6+4+7+4+6+2+2+9+2+3+3+1+2+3+4\\&+9+5+2+7\end{aligned}}{58}$$

$$= \frac{238}{58}$$

$\therefore$ Mean word length = 4.103 letters

Sub mean word length into median-median line, $y = 4.103$ letters:

$$y = \frac{1}{2}x + 2.1$$

$$4.103 = \frac{1}{2}x + 2.1$$

$$x = 2(4.103 - 2.1)$$

$$= 4.007 \text{ years old}$$

$\therefore$ The appropriate age level for the passage is 4.007 years old or about 4 years old.