

Q1-

- a- I have learnt to model equations, functions, and data. This helped me in visualizing the problems and becoming familiar with the real meaning of the concepts.
- b- In the future, I am planning that I'll use more real-life applications to visualize the concepts. I believe this will help me to understand better.

Q2-

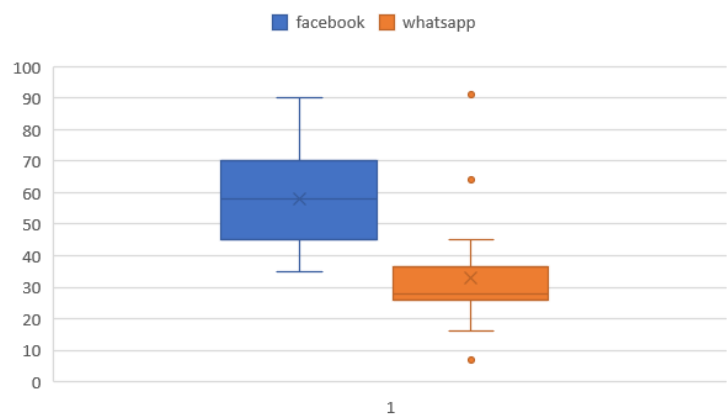
a- (i)

—	Facebook	WhatsApp
Min	35	7
Median	58	28
Max	90	91
Mean	58.1	33.0
SD	14.9	17.6
IQ range	20.3	9.5
Range	55	84

(ii) Ambarine stays more time on average at Facebook than at whatsapp. The average time at Facebook is 58.1 while on Whatsapp is 32.95

(iii) the greatest variability of time is on Whatsapp because it has a range of 84 compared to a 55 for facebook. We obtained this data through comparing the Max and Min value to calculate the range.

b- (i)



(ii) the data is positively (right) skewed, this tell us that most data falls to the right near the 28

(iii) (1) False, because the median is on 58 minutes. so it's on about half of the days she spent more than 58 minutes

(iii) (2) True, because the quarter of days on the box-plots is higher than 68 minutes. Thus, there are 15 days (three-quarters) of the days she spent less than 68 minutes on Facebook

c- The first graph represents the Facebook data because the max value for Facebook data is 45 which corresponds to the histogram. Moreover, the mean of the Facebook data which represents the avg. values is equal to 29.2 which corresponds with data in fig 1 also as the mean of the graph is in the same region.

Q3-

a- (i) $\frac{2-1}{\left(\frac{5}{2}-\left(-\frac{3}{2}\right)\right)} = \frac{1}{4} = 0.25$

(ii) $y = 0.25x + C$

$$2 = \frac{5}{2} * 0.25 + C$$

$$C = \frac{11}{8}$$

(iii) $0 = 0.25x + \left(\frac{11}{8}\right)$

$$-\frac{11}{8} = 0.25x$$

$$x = -11/2$$

b- No it doesn't lie on the line because when X = 4 the Y of the line = 19/8

c-

$$11x + 4y = 2$$

$$-4x + 4y = 2$$

----- (Minus)

$$15x = 0$$

$$x = 0$$

$$\text{at } x = 0$$

$$4y = 2$$

$$y = 0.5$$

The two lines intersect at (0,0.5)

d- (i) at X = 0 the Y-intercept occur Then, y = 6 ---- Y-intercept point is (0,6)

(ii) 1/ $-0.33 * 9 + 0.84 * 3 + 6 = 5.55$ They meet at point (3,5.55)

2/ The child won't clear the slide because at t=3, the min. height he would reach is 5.55 meters at t=3

(iii) 1/ Using the quadratic formula, a=-0.33 b=0.84 c=6. roots are: $\frac{14+2(599)^{\frac{1}{2}}}{2}$, $\frac{14-2(599)^{\frac{1}{2}}}{2}$. the negative root is rejected because the function

domain is [0,6]. Then, the X- intercept is $\left(\frac{14+2(599)^{\frac{1}{2}}}{2}, 0\right)$

2/ They will land when y is equal to zero. Thus, they will land at the x-intercept point. Thus, the horizontal distance is $\frac{14+2(599)^{\frac{1}{2}}}{2}$ approximately equals to 5.706

Q4 –

a- (i) $11x = -11, x = -\frac{11}{11} = -1$

(ii) $10 - \left(\frac{3}{2}\right) + 12x = \left(\frac{1}{3}\right)x + 9$

$$8.5 - 9 = -12x + \left(\frac{1}{3}\right)x$$

$$-0.5 = \left(-\frac{35}{3}\right)x$$

$$x = \left(\frac{3}{70}\right)$$

(iii) $\frac{-4x * (x+5)}{(x-6) * (x+5)} + \frac{3(x-6)}{(x-6) * (x+5)} = -4$

$$\frac{-4x * (x + 5) + 3(x - 6)}{(x - 6) * (x + 5)} = -4$$

$$-4x(x + 5) + 3(x - 6) = -4(x - 6)(x + 5)$$

$$-4x^2 - 20x + 3x - 18 = -4x^2 - 20x + 24x + 120$$

$$21x = -138 \gg x = -\frac{46}{7}$$

b- $(2x - 3) * (x + 13) = 0$

$$1/ 2x - 3 = 0 \gg \gg x = 3/2$$

$$2/ x + 13 = 0 \gg \gg x = -13$$

the solutions are 3/2 and -13

c- (i) $a - \left(\frac{2}{3}\right)b = 7b - 3c \left(\left(\frac{4b}{3}\right) - 3\right)$

$$3a - 2b = 21b - 9c \left(\left(\frac{4b}{3}\right) - 3\right)$$

$$3a - 2b = 21b - 12bc + 27c$$

$$3a - 27c = 21b + 2b - 12bc$$

$$3a - 27c = 23b - 12bc$$

$$3a - 27c = b(23 - 12c)$$

$$b = \frac{(3a - 27c)}{(23 - 12c)}$$

(ii) - In step 2, you tried to multiply both sides by 3. when multiplying an equation you should multiply each term in it. Thus the term $-3c \left(\left(\frac{4b}{3}\right) - 3\right) * 3$ is equal to $-9c \left(\left(\frac{4b}{3}\right) - 3\right)$ the mistake that you made is multiplying the coefficient and the bracket also, and this is incorrect because it's one term. Your multiplication is equal to multiplying by 6 not 3

- in step 3, you multiplied $-9c * (4b - 9)$. Thus, the correct output is $-36bc + 81c$ not $-36bc - 81c$. Your mistake is that you multiplied -ve with -ve without changing the sign.

Q5 –

a- $2 * 3.14 * r = 5.7$ meters

b- $3.14 * 0.9^2 - 3.14 * 0.05^2 = 2.5$ cubic meters

c- $(3.8^2 + 1.8^2)^{\frac{1}{2}} = 4.2$ meters

d- A = 65, B = 25, C = 90

e- scale factor = $\frac{\text{length of reduced side}}{\text{length of original side}} = \frac{3.6}{3.8} = \frac{18}{19}$ (reduction scale factor) approximately equal to 0.95

f- It will be the same because the two triangles are similar which means they have the same angles

g- (i) using cos law, $EF = (4.3^2 + 2.7^2 - (2 * 4.3 * 2.7 * \cos 120))^{\frac{1}{2}} = 6.1$ meters

(ii) using sin law, $\frac{4.3}{\sin DEF} = \frac{6.1}{\sin 120}$ >>> angle DEF = 37°

(iii) $A = 0.5 * EF * DE * \sin 37 = 0.5 * 6.1 * 2.7 * \sin 37 = 5.0$ meter squared

Q6 –

a- (i) $v = 3000(9 - 6) + 5000$

$$v = 3000 * 3 + 5000$$

$$v = 14000 \text{ vocabs}$$

(ii) Means that the domain of the function is [6,12] that means that function works from t = 6 to t = 12

(iii) $20000 = 3000(t-6) + 5000$ >>> $15000 = 3000t - 18000$ >>> $33000 = 3000t$ >>> t = 11 years

(iv) $v = 3000t - 18000 + 5000$

$$y = 3000t - 13000$$

as the gradient is the slope of the function. Then, the gradient is the t coefficient and equal to 3000

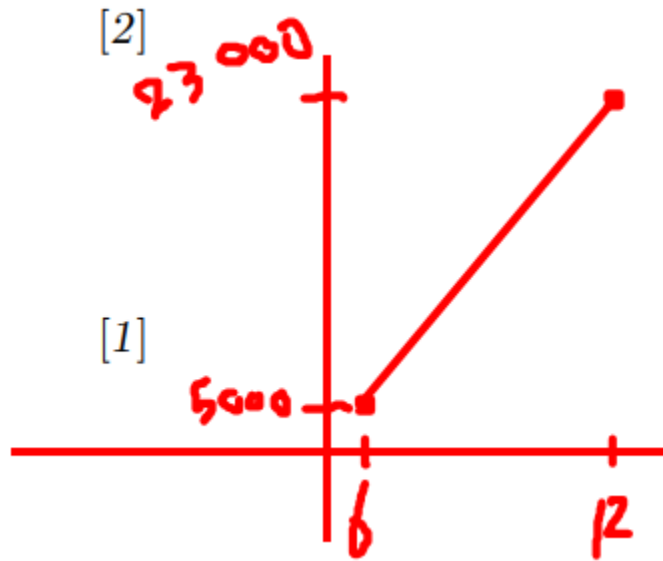
- means that with every 1 year increase the vocab number increases by 3000

(v) because of the -6, the v-intercept occur when

$$x = 0. \text{ at } x = 0, v = 3000 * -6 + 5000 = -13000$$

then the v-intercept is -13000

(vi)



- b- (i) $v(18) = 0.27 * 1.26^{18} = 17$ words, $v(30) = 0.27 * 1.26^{30} = 227$ words
(ii) scale factor is 1.26^t and the function increases by 26% each month.
(iii) $500 = 0.27 * 1.26^t$

$$\begin{aligned} 500/0.27 &= 1.26^t \\ \ln(500/0.27) &= t \ln(1.26) \end{aligned}$$

$$t = \frac{\ln\left(\frac{500}{0.27}\right)}{\ln(1.26)} \text{ months} \gg \gg \text{approximately equals 32 months}$$