

- 1) In the distance, an airplane is taking off. As it ascends during take-off, it makes a slanted line that cuts through the rainbow at two points. Create a table of at least four values for the function that includes two points of intersection between the airplane and the rainbow.

$$y = -x^2 + 36$$

x	y
-6	0
4	20
0	36
-2	32

Points chosen on graph
 $(-6, 0)$ and $(4, 20)$

Equation of line

$$m = \frac{\Delta y}{\Delta x} = \frac{0 - 20}{-6 - 4} = \frac{-20}{-10} = 2$$

$$y = mx + c \quad 2 = \frac{y - 20}{x - 4}$$

$$y - 20 = 2x - 8$$

$$y = 2x + 12$$

Equation of line is $y = 2x + 12$

- 2) Analyse the two functions. Answer the following reflection questions in complete sentences.

- i) What is the domain and range of the rainbow? Explain what the domain and range represent. Do all of the values make sense in this situation? Why or why not?

Domain: All real numbers $(-\infty < x < \infty)$ Since the parabola graph continues downwards towards the left and down towards the right and it represents the rainbow's path. $\rightarrow$ (All real numbers less or equal to 36) *

Range: $y \leq 36$ Because the maximum y-value of the rainbow function or parabola is 36, and the graph continues to extend downwards and it represents how far the rainbow goes.

The values make sense because the maximum is infinity in the domain and 36 in the range.

- ii) What are the x- and y-intercepts of the rainbow? Explain what each intercept represents?

The x-intercept are $(-6, 0)$ and $(6, 0)$. It represents where the parabola touches the x-axis (hits the ground).

The y-intercept is $(0, 36)$. It represents the maximum height of the rainbow and where (the highest point of the rainbow) Pg 1 of 3

ii) Is the linear function ~~task~~ created with your table positive or negative? Explain.

P The linear function is positive. This is because ~~the~~ it ~~has~~ points upwards hence the gradient is positive.

iv) What are the solutions or solution to the system of equations created? Explain what it or they represent?

The solutions to the system of equations created are $(-6, 0)$ and $(4, 20)$ because it is where the parabola intercepts the linear function.

3) Create your own piecewise function with at least two functions. Explain, using complete sentences, the steps for graphing the function. Graph the function by hand or using a graphing software of your choice (remember to submit the graph).

The equation created is

$$y = -2x + 8 \text{ when } x \leq 4$$

$$y = 0.5x - 2 \text{ when } x > 4$$

i) Create a table for the continuous piecewise function.

x	0	1	2	3	4
y	8	6	4	2	0

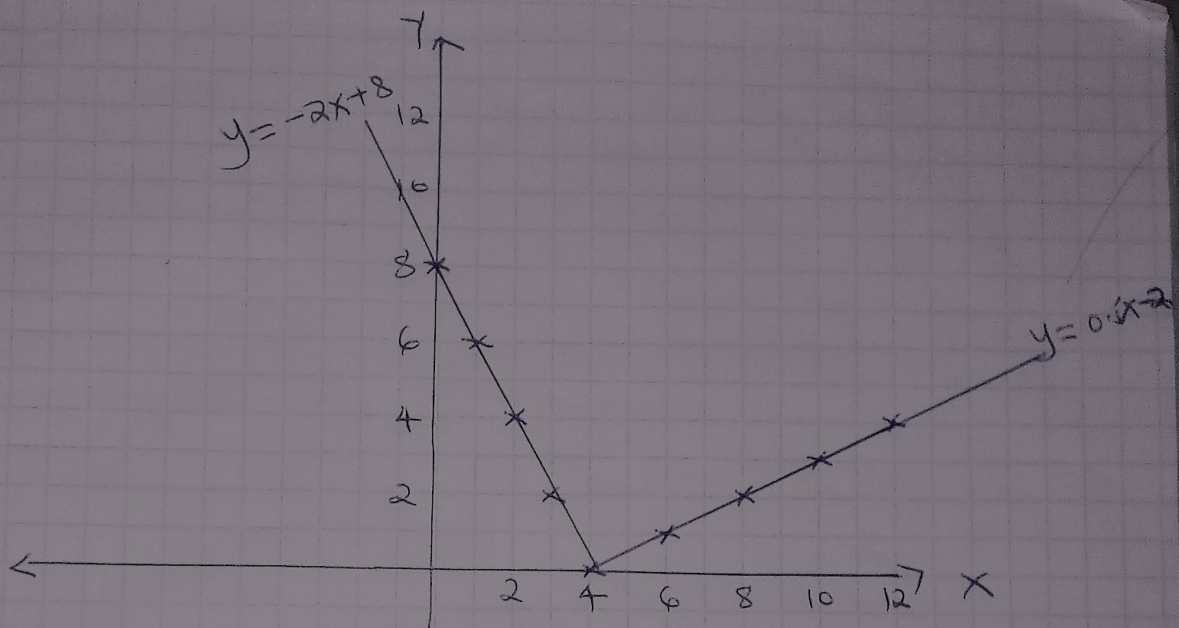
$$y = -2x + 8$$

x	6	8	10	12
y	1	2	3	4

$$y = 0.5x - 2$$

ii) Plot the points of each function on a semi-same graph

iii) The next step after plotting the graph is to keep the piece of the function as shown by $x \leq 4$ which is a closed circle and an open circle started by $x > 4$



The solution to this system of equations is $(4, 0)$

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