

# LINEAR FUNCTIONS

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## Teatime recipe



Will you try this delightful recipe for teatime?

## Banana Nut Bread

*A moist tea bread recipe containing mashed bananas and chopped walnuts.  
Useful for using up bananas that are getting over ripe.*

4 oz butter, softened	1 teaspoon bicarbonate soda
6 oz caster sugar	2 very ripe bananas
2 eggs, well beaten	12 oz self-raising flour
3 tablespoons sour milk	1 teaspoon vanilla essence
6 oz chopped walnuts	

Set oven to 350°F or Mark 4. Grease and bottom line a 2 lb loaf tin. Cream the butter and sugar together in a bowl until light and fluffy, then mix in the eggs. Mix the bicarbonate of soda with the sour milk. Mash the bananas, add them to the mixture with the flour and milk and mix well. Stir in the vanilla essence and the nuts. Put into the tin and bake for 40 to 45 minutes until firm and a skewer inserted comes out clean. Leave in the tin for 15 minutes then turn out on to a wire rack. When cold, serve sliced and buttered.

...But what the hell are “oz”, “°F” or “lb”?

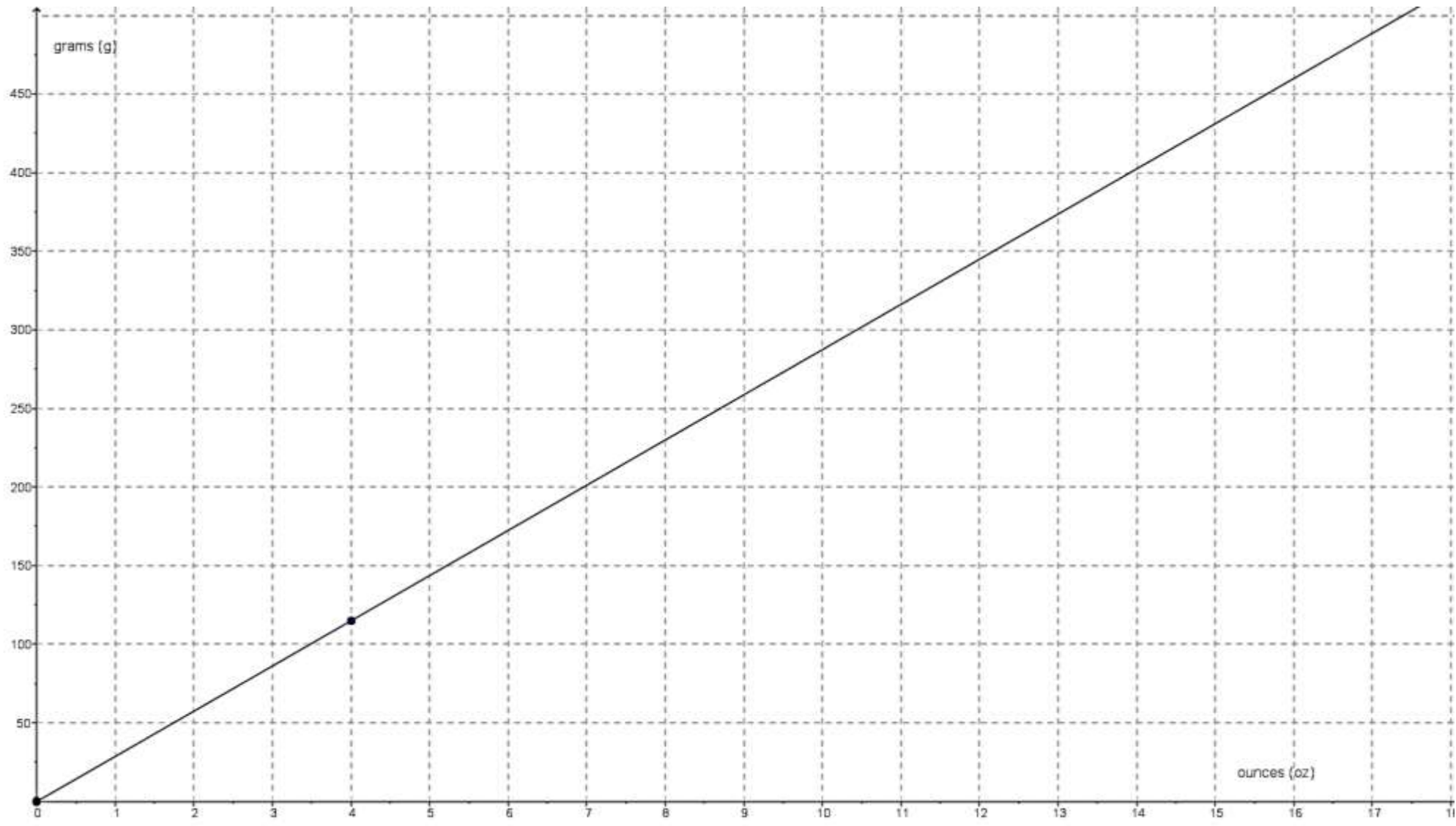
### A. Task 1 : Avoirdupois, Imperial

The **avoirdupois system** is a system of weights (more properly, mass).

It is based on a **pound (lb)** of sixteen **ounces (oz)**.

It is the everyday system of weight used in the United States and is still used to varying degrees in everyday life in the United Kingdom, Canada, the Republic of Ireland, and some other former British colonies despite the official adoption of the metric system.

Ounces and grams are proportional.



1. Use the previous graph to complete the table below:

Ounces (oz) $x$	Grams (g) $f(x)$
1	
2	
3	
	115
5	
6	
7	
8	
$x$	$f(x) =$



$x m$

2. Find the proportionality constant  $m$ .

3. Let  $f$  be the function that **maps** the mass  $x$  expressed in ounces **onto** the mass expressed in grams.

Write the expression of the function  $f$ :

$$f(x) = \dots\dots\dots$$

4. Refer to the recipe and convert the quantities in grams

Ingredients	Weight in ounces (oz)	Weight in grams (g)
Butter		
Self-raising flour		
Walnuts		
Sugar		

5. How many kilograms can a **2 lb** tin bear?



## B. Temperatures

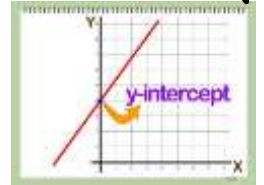
Fahrenheit (denoted °F) is a temperature scale named after the German physicist Gabriel Fahrenheit (1686–1736), who proposed it in 1724. The Fahrenheit scale was the primary temperature standard for climatic, industrial and medical purposes in most English-speaking countries until the 1960s. **Oven temperatures** may be quoted in degrees in Celsius (International), Fahrenheit (in Canada and USA) or by gas mark (sometimes in the UK and France).

The following table shows a comparison of the two temperature scales:

Point	Temperature °F	Temperature °C
A	68	20
B	500	260



1. **Plot** the points A (68°F, 20°C) and B (500°F, 260°F) in a coordinate plane (scale : 1cm = 20°F on the x-axis ; 1 cm = 10°C on the y-axis). Choose a landscape view.
2. Draw the line (AB) (The relationship between the two scales is **linear**).
3. Draw the point P, intersection of the line (AB) with the y-axis.
4. What are the coordinates of the point P?
5. The y –coordinate of the point P is called the **y-intercept** of the line (AB). The y-intercept of the line (AB) is :



$$p = \dots\dots$$

It is the temperature in °C corresponding to .....°F.

6. Read the graph to complete the following table:

$x$ °F	0	200	250	275	300	325	350	375	400	425	450	475	500
$y$ °C													



The steepness of the line is the slope  $m$  (also sometimes called gradient).

7. Find the value of  $m$ .

$$m = \dots\dots$$

8. Find the equation of the line (AB):

$$y = \dots\dots x + \dots\dots$$



The function  $f$  that **maps** the temperature in ° Fahrenheit **onto** the temperature in °Celsius here is said to be **linear**, because it's a line. The expression of  $f$  is  $f(x) = \dots\dots x + \dots\dots$

Convert the oven temperature required for baking the Banana Loaf:

°F $x$	°C $f(x)$
350	

Enjoy!