Maths Week/Pāngarau Wiki 2025

Daily Dollar/Ko te Tāra o te Rā

Bill Ellwood Memorial Series

This series is a tribute to Bill Ellwood, who wrote much of the Maths Week material from 2006 to 2019. Bill passed away in June 2021.

Set E Day 1

For students

WHAT TO DO FOR STUDENTS

1 You may work on your own or with someone else, and your teacher or someone else can help you.

2 Answer the questions.

3 Each question has a dollar value. Each day's questions total $100 in value.

4 When you have answered the questions, your teacher will give you the answers.

5 If you are right, you will get the dollar value for each question. You then you can work out how many dollars you have earned for the day.

6 Add the number of dollars you have earned each day in the Daily Dollar questions and get a total for the week. Then you can compare your total for the week with others in your class.

7 Perhaps your teacher may award a prize for the highest total for the week!

8 Good luck!

In this worksheet, you will be dealing with points and lines. Your teacher may give you pages with grids and axes already drawn so that you can answer the questions without having to draw your own.

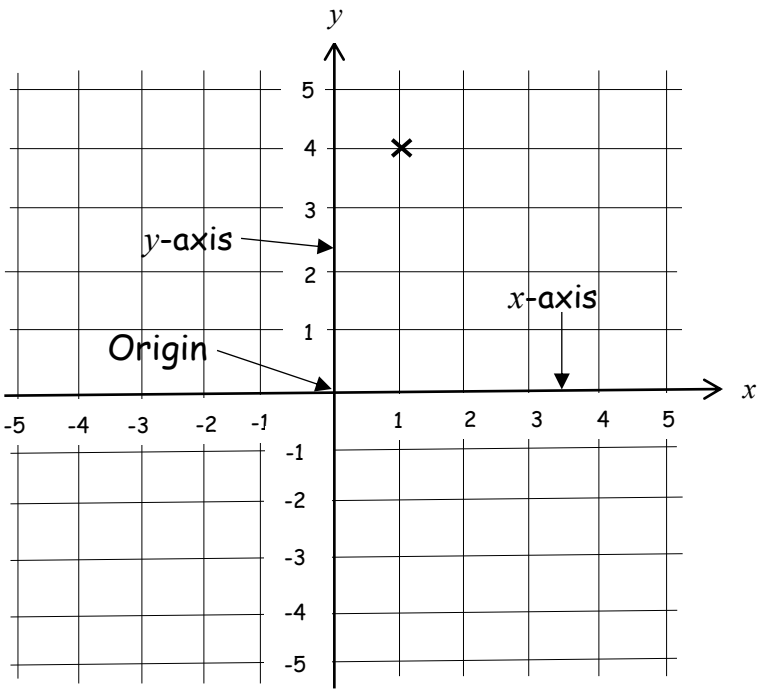
A graph has two axes – the ***x*-axis** and the ***y*-axis**. The point where the axes meet is called the **origin**.

Each point on a graph has two **coordinates** – the x-coordinate and the y-coordinate. For the point (1, 4), the x-coordinate is 1 and the y-coordinate is 4.

(1, 4)

x-coordinate y-coordinate

The diagram on the right shows a set of axes and the point (1, 4).



Question 1 ($5)

Draw a set of axes labelled from -5 to 5 (like the diagram above).

On the axes, plot each of the points A – E below. Label each point with its name (letter) and coordinates.

(a) A (2, 5)

(b) B (4, -3)

(c) C (0, 2.5)

(d) D (-5, 0)

(e) A is reflected in the x-axis to point A' (A' is read "A dash"). Plot A', and write its label and coordinates.

Question 2 ($5)

Draw a set of axes labelled from -5 to 5.

(a) Plot the points (-2, 3), (1.6, 3), (2, 3) and (5.8, 3) on the axes.

(b) There is a pattern in the coordinates of the points you plotted in (a). If you were to plot **all** points that fitted on the grid with the same pattern, what would the result be? Draw this on the grid.

(c) The line you drew in (b) has the **equation** $y = 3$ since all points on the graph follow this rule. On the grid, draw the lines whose equations are $y = 1$ and $y = -4.2$, and label each line with its equation.

Question 3 ($5)

Draw a set of axes labelled from -5 to 5.

(a) Plot the points (1, -2), (1, 3) and (1, 4.2) on the axes.

(b) There is a pattern in the coordinates of the points you plotted in (a). If you were to plot **all** points that fitted on the grid with the same pattern, what would the result be? Draw this on the axes.

(c) The graph you drew in (b) has the equation $x = 1$ since all points on the graph follow this rule. On the grid, draw the graphs whose equations are $x = 4.7$ and $x = -3$, and label each line with its equation.

Question 4 ($30)

Draw a set of axes labelled from -5 to 5.

(a) Plot the points (1, 1), (2.5, 2.5) and (5, 5) on the axes.

(b) There is a pattern in the coordinates of the points you plotted in (a). If you were to plot **all** points that fitted on the grid with the same pattern, what would the result be? Draw this.

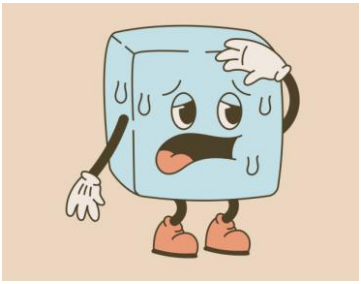
(c) The line you drew in (b) has the equation $y = x$ since all points on the graph follow this rule. On the grid, draw the line whose equation is $y = -x$.

(d) Label each line with its equation.

(e) What are the coordinates of the origin?

(f) What is the equation of the x-axis?

(g) What is the equation of the y-axis?



Question 5 ($20)

Draw a set of axes labelled from -5 to 5.

(a) On the axes, draw the line whose equation is $y = 2$.

(b) Draw the triangle K whose vertices have the coordinates (-1, 1), (-4, 1) and (-4, -1).

(c) Draw the reflection of the triangle K in the line $y = 2$.

(d) Draw the graph whose equation is $y = x$.

(e) Draw the triangle L whose vertices have the coordinates (4, 3), (5, 3) and (5, 1).

(f) Draw the reflection of the triangle L in the line $y = x$.

Question 6 ($35)

Draw a set of axes labelled from -5 to 5.

(a) Draw the triangle whose vertices are A(2, 3), B(5, 1) and C(2, 1). Label the vertices (but don't write the coordinates).

(b) The triangle ABC is reflected in the x-axis to give the triangle A'B'C' (A' is read "A dash" ', and similarly for the B' and C'). . Draw the triangle A'B'C' and label the vertices (don't write the coordinates).

(c) The triangle A'B'C' is reflected in the y-axis to give the triangle A''B''C'' (A'' is read "A double dash", and similarly for the B'' and C''). Draw the triangle A''B''C'' and label the vertices (don't write the coordinates).

(d) Triangle A''B''C'' could be described as a single transformation of triangle ABC. Describe this transformation fully.

See if you can answer (e) – (g) without drawing a diagram. Looking at your answers to previous questions may be helpful.

(e) The point (1, 4) is reflected in the *x*-axis. What are the coordinates of the image?

(f) The point (1, 4) is reflected in the *y*-axis. What are the coordinates of the image?

(g) The point (1, 4) is reflected in the line *y* = *x*. What are the coordinates of the image?