Problem of the Week: Week 4 (Sum1): Year 10: Algebra: Linear and quadratic graphs

- use the form y=mx + x c to identify parallel **{and perpendicular}** lines; find the equation of the line through two given points, or through one point with a given gradient
- recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function $y = \dfrac{1}{x}$ with $x \neq 0$,

{the exponential function y = kˣ for positive values of k, and the trigonometric functions (with arguments in degrees) , y = sin x, y = cos x and y = tan x for angles of any size}

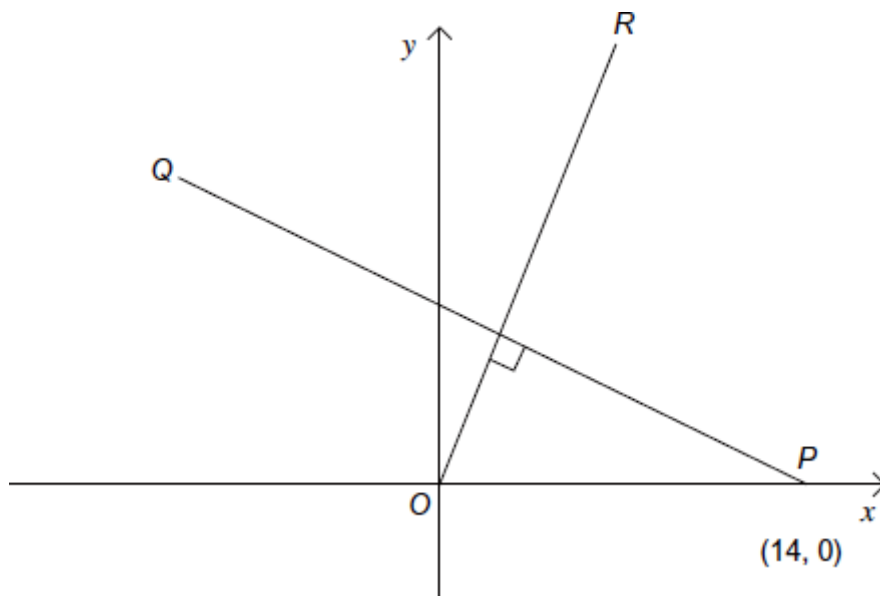**{sketch translations and reflections of the graph of a given function}**

Perpendicular Lines

The gradient of line OR is $\dfrac{7}{4}$

PQ is perpendicular to OR.
P is the point (14, 0).
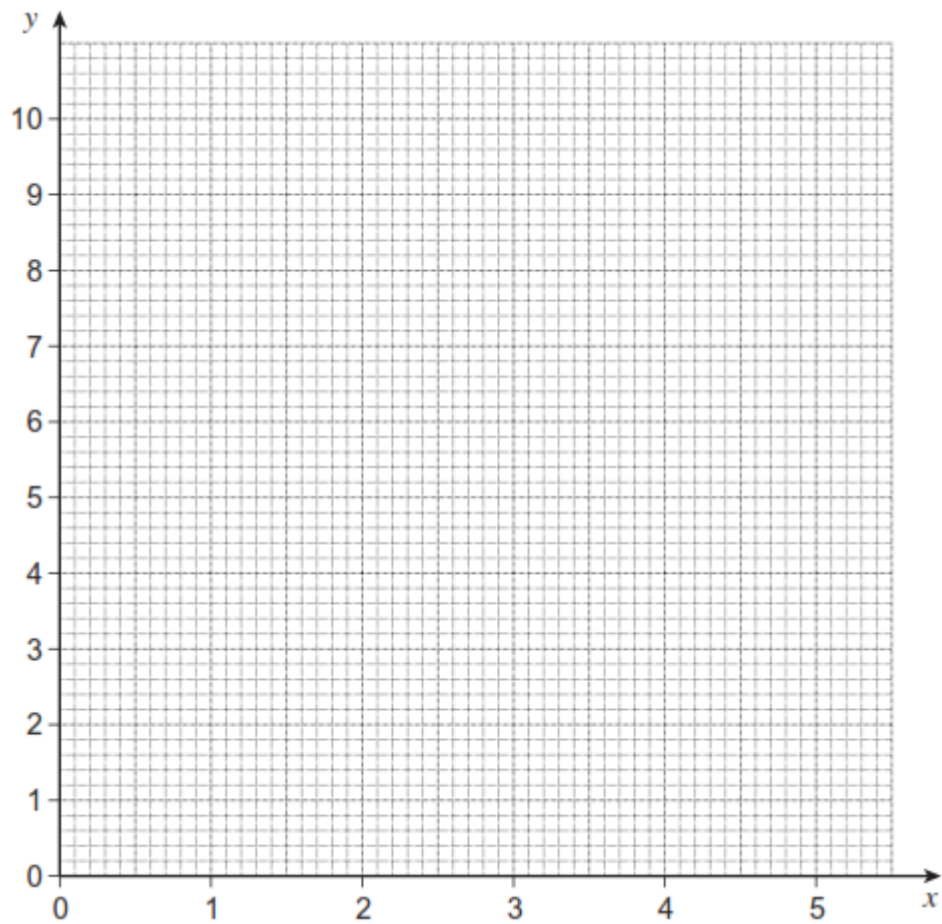
Not drawn accurately

Work out the equation of line PQ.
Give your answer in the form $ax + by = c$, where a, b and c are integers.

Parallel Lines

Complete the table of values for $2x + y = 10$

x	0	1	2	3	4	5
y	10		6		2	

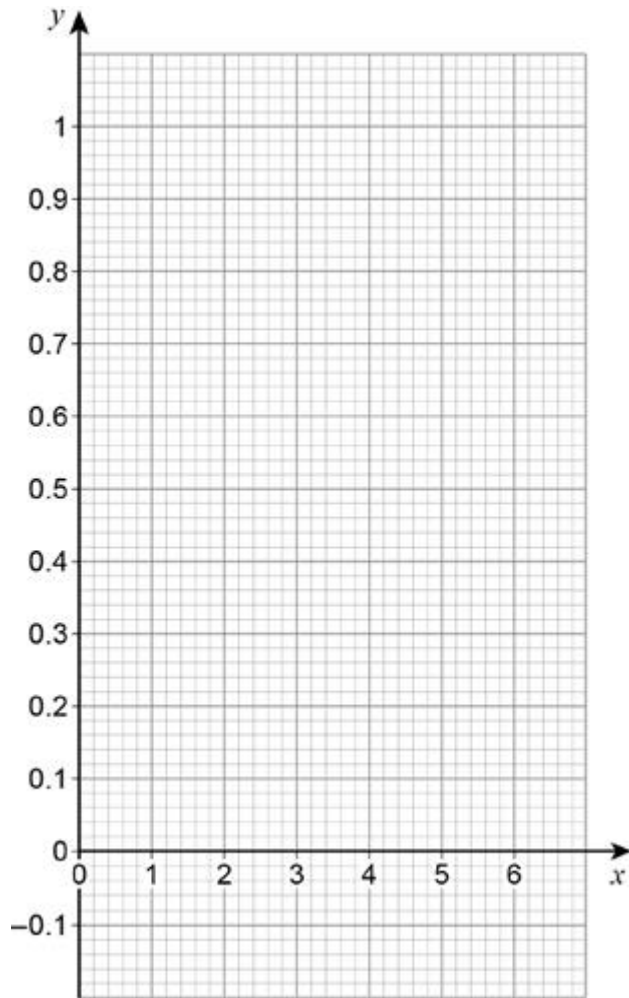On the grid draw the graph of $2x + y = 10$ for values of x from 0 to 5.

Draw three other lines that are parallel to $2x + y = 10$ and state their equations.

Challenge: The exponential function

Draw the graph of $y = 0.8^x$ for values of x from 0 to 6

x	0	1	2	3	4	5	6
y							

Exponential function (2)

The point $\left(3, \dfrac{1}{64}\right)$ lies on the curve $y = k^x$ where k is a constant.

Show that the point $\left(\dfrac{1}{2}, \dfrac{1}{2}\right)$ lies on the curve.

HIAS HOME LEARNING