Functions Problems

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Question 1

$$f(x) = 2x + 5$$

Find: $f(3), f(4), f(1), f(-2), f(-3)$

Question 2

$$f(x) = x^2 + 1 \, , g(x) = 2x$$

(i)   Find $f(\sqrt{3})$ and $g(1)$

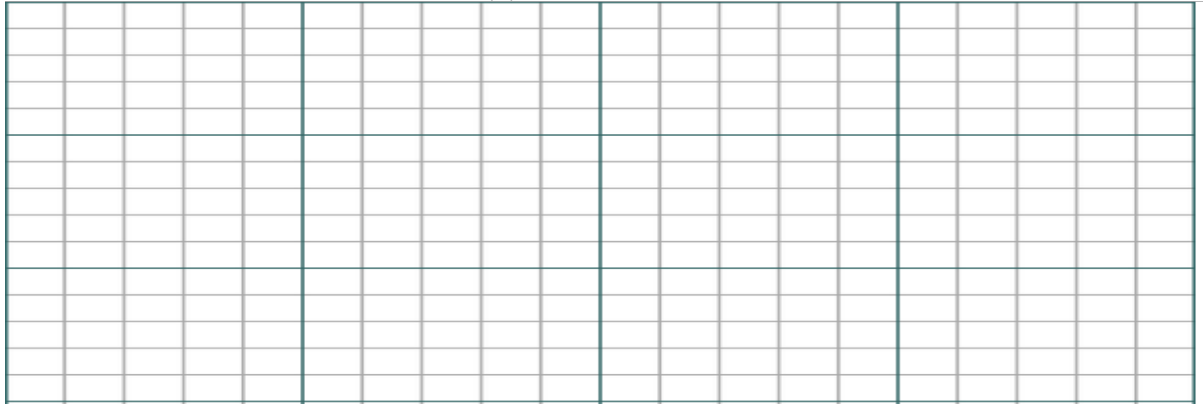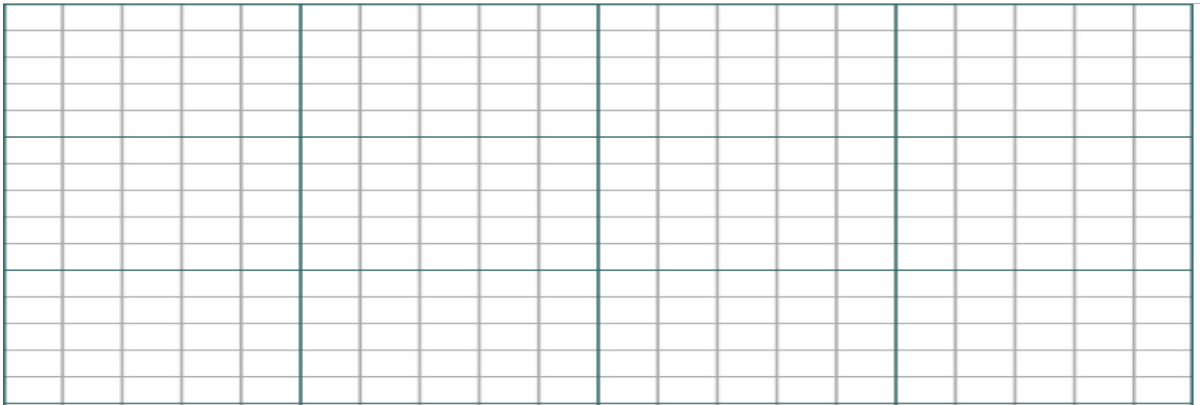(ii)   Find the value of k for which $f(\sqrt{3}) = kg(1)$

(iii)   Find the value of x for which $f(x) = g(x)$

Question 3
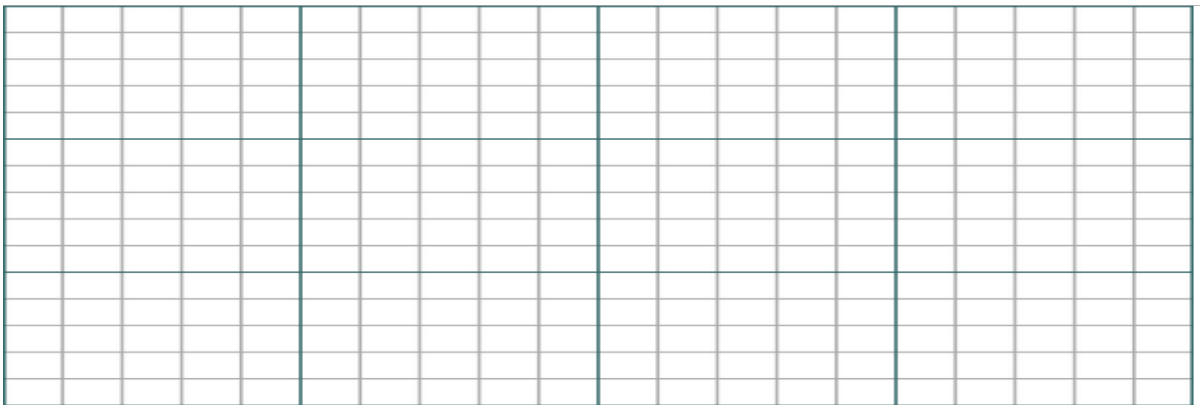
$$g(x) = 2x^2 + bx + 3$$

If $g(2) = 3$ find the value of the x coefficient b.

Question 4

$$h(x) = x^2 + x + q$$

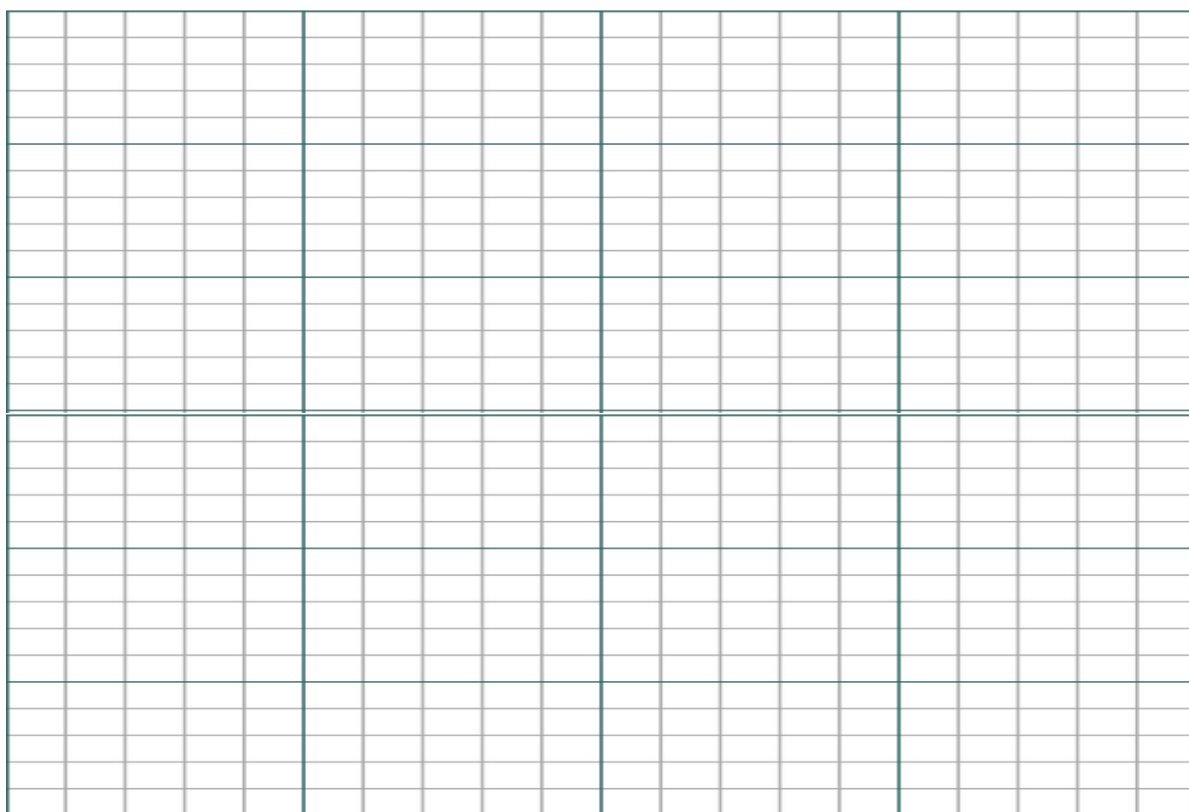(i)   If $h(-3) = 0$ then find a value for q

(ii) Hence solve $h(x + 5) = 0$

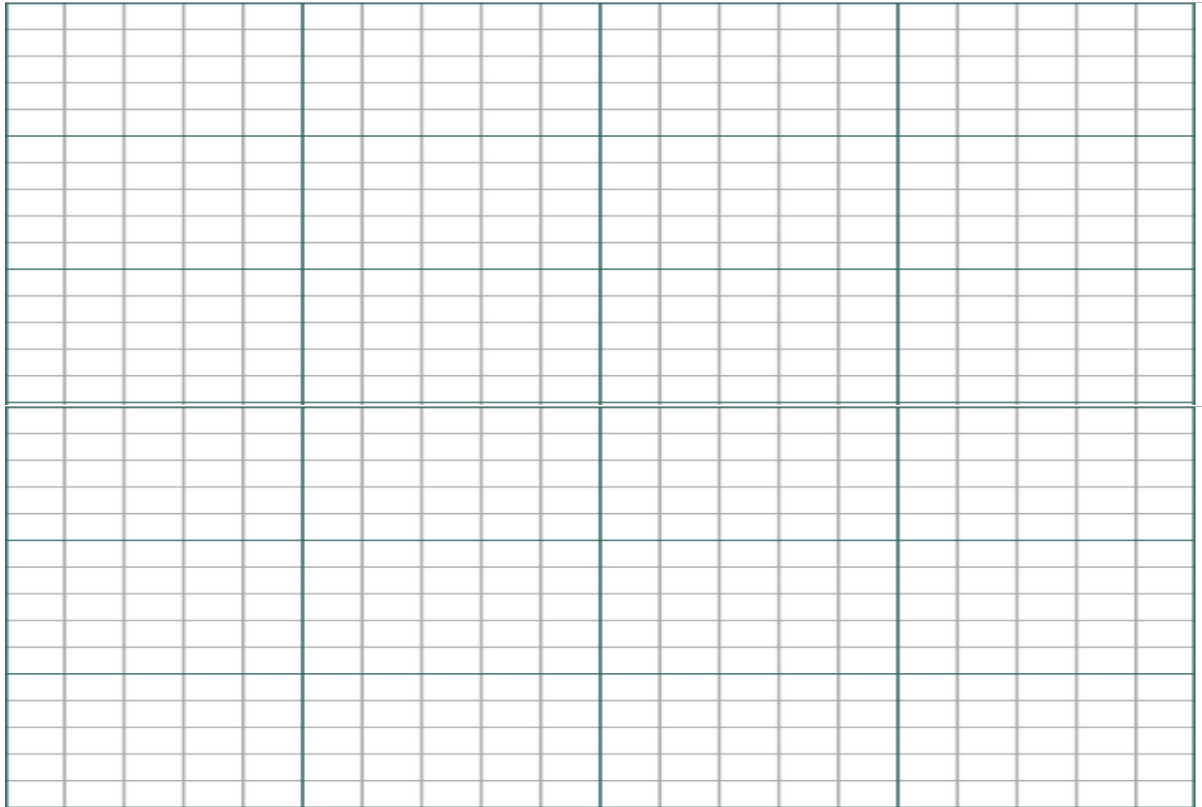# Question 5

Graph the following function

$$g(x) = 5x + 2, in\ the\ domain\ of\ -2 \leq x \leq 4$$

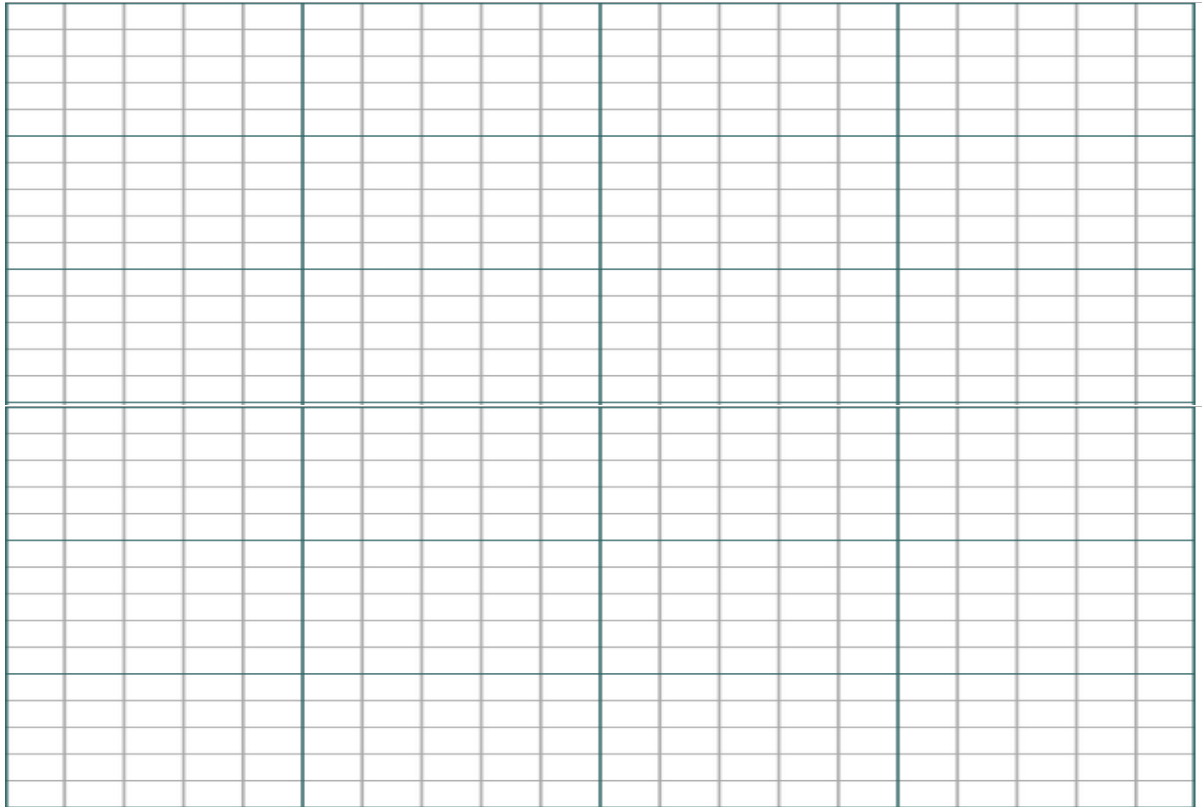# Question 6

Graph the following on the same axis

$$f(x) = 5 + 2x - x^2, g(x) = 2 - x \text{ in the domain of } -2 \leq x \leq 4$$

Question 7

Graph the following function

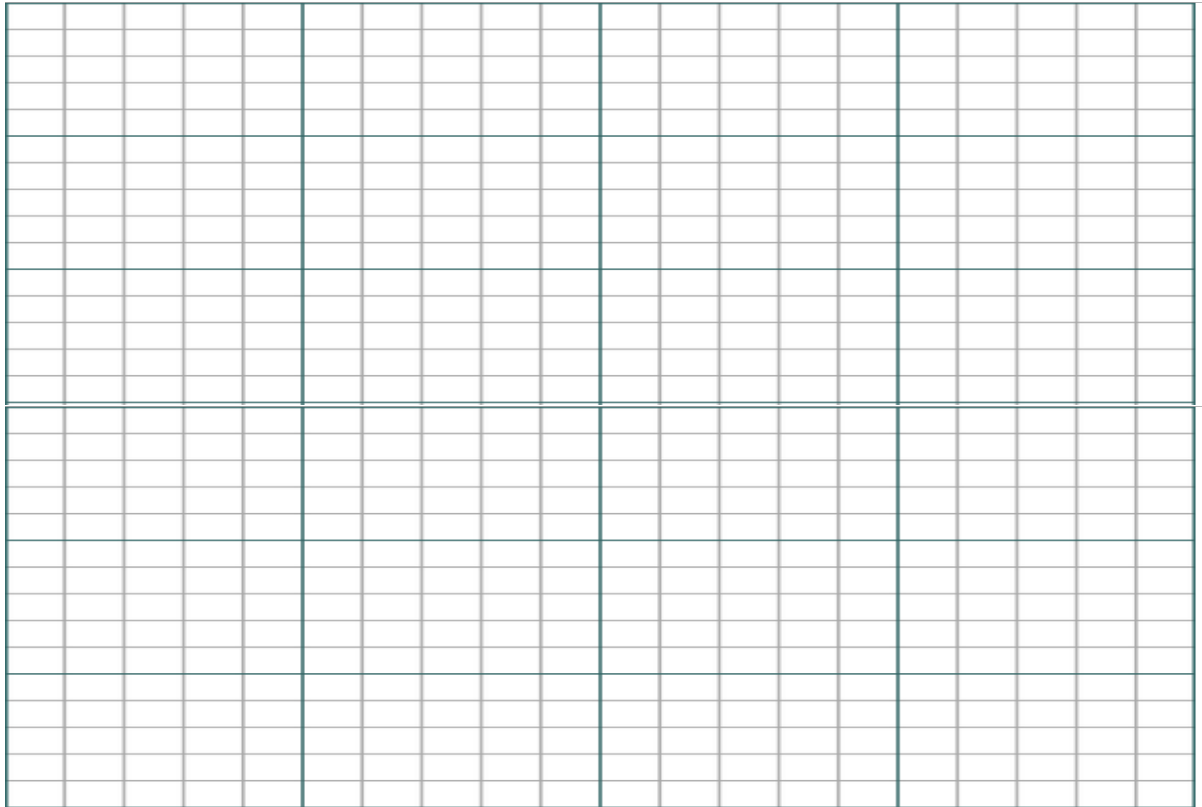$$f(x) = 2x^2 + x - 6, \text{ in the domain of } -3 \leq x \leq 2$$

Use the graph to estimate:

   i.   The values of x for which $f(x) = 0$

   ii.   The minimum value of $f(x)$

   iii.   The values of x for which $f(x) = -5$

   iv.   The value of $f(2.8)$

   v.   The values for which $f(x) > 0$

   vi.   Values for x for which $2x^2 + x - 6 = 4$

Question 8

Graph the following functions on the same axis and use the graph to find:
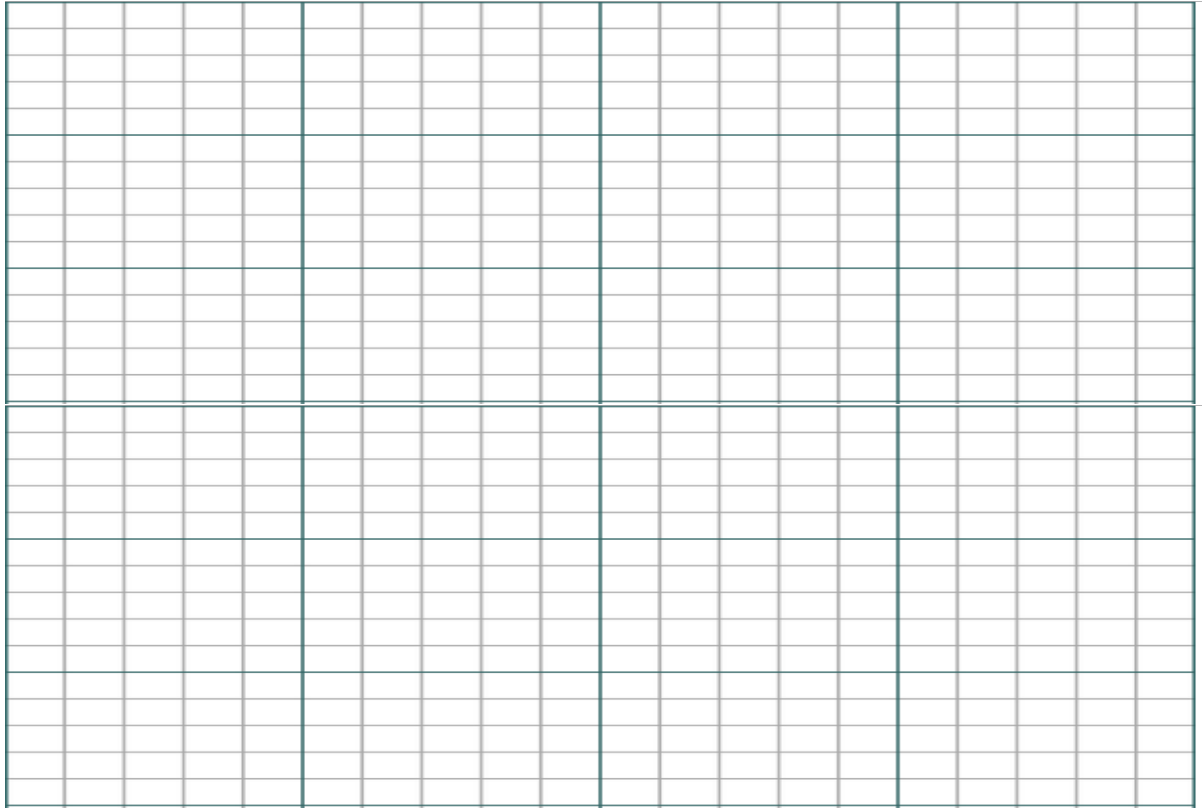
$$f(x) = x^2 - 2x - 3, \qquad g(x) = x - 3$$

i. The values of x for which $f(x) = 0$

ii. The minimum point of $f(x)$

iii. The values of x for which $f(x) = g(x)$

Question 9

The perimeter of a rectangle is 20m and the length of its base is x m. Show that its width is 10-x, hence show that the area of the rectangle is given by $A(x) = 10x - x^2$.

Graph this function in the domain of $0 \le x \le 10$

i.   What is the maximum area of the rectangle

ii. What are the dimensions of the rectangle at this area

iii. The area of the rectangle when the length is 4m

iv. Width of the rectangle when the length 7m

v.   The length of the rectangle when its area is 12.75m²