BECA / IB Math 01-Linear functions Name:
27 October 2021

PreQuiz: I can model arithmetic sequences

Arithmetic sequences

Terms: $u_n = u_1 + d(n-1)$

Sum: $S_n = \frac{n}{2}(u_1 + u_n)$

1. Given the arithmetic sequence $2, 7, 12, 17, \ldots$
   (a) Find the common difference d.

   (b) Write down the next term, u_5.

   (c) Find the fifteenth term.

   (d) Find the sum of the first fifteen terms.

2. In an arithmetic sequence the first term is 11 and the fourth term is 26.
   (a) Find the common difference d.

   (b) Find the tenth term, u_{10}.

   (c) Find the sum of the first ten terms.

3. The second term of an arithmetic sequence is 16 and the seventh term is 6.

   (a) Find the common difference d.

   (b) Find the first term, u_1.

   (c) Find the sum of the first seven terms.

4. The rate on a credit card is 18% per annum. Find the total amount due on a \$250 purchase after one month (principal and interest).

5. Robert takes out a 5 month loan to purchase and repair a used car for resale. The principal amount is 20,000 euros and interest rate is 7.50% per annum. Find the interest Robert pays.

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Equations of a straight line: $f(x) = mx + c$, $ax + by + d = 0$, $(y - y_1) = m(x - x_1)$

Gradient: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

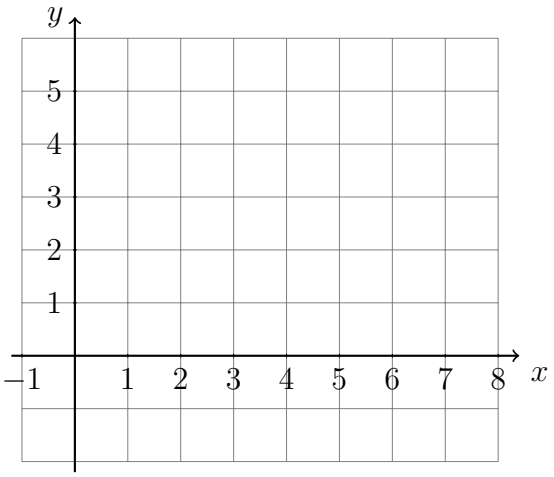
6. Given the linear function $f(x) = -2x + 4$. [4]

   (a) Write down it's slope.
   $m =$

   (b) Write down it's y-intercept.
   $b =$

   (c) Draw the function f on the grid.

   (d) Label the x-intercept with its coordinates as an ordered pair.

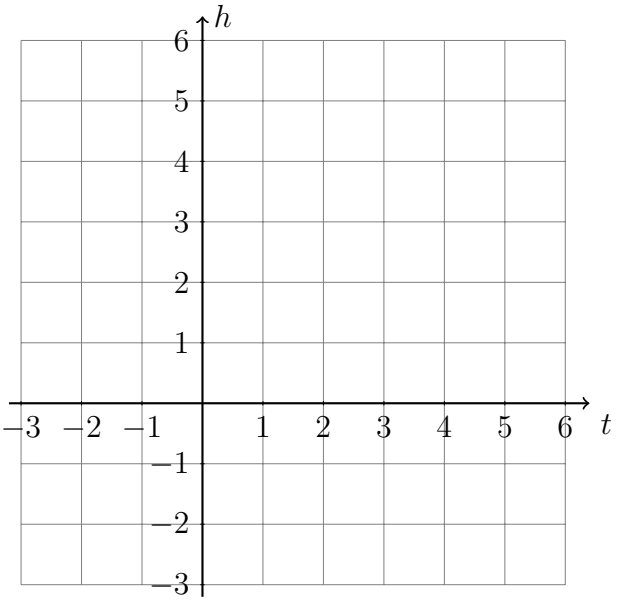


7. The height of a plant h in centimeters over a period of time t measured in weeks is shown in the table. [3]

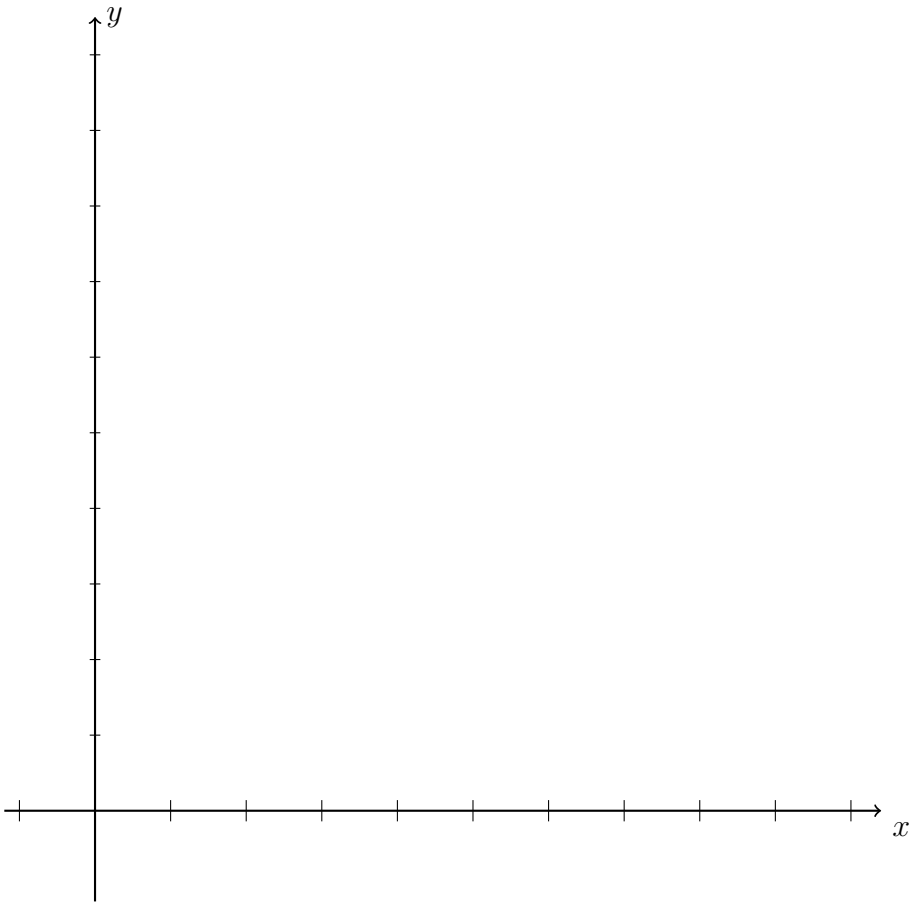
   (a) Plot the data as points on the grid.

   (b) Draw a line of best fit on the graph.

t	h
1	1
2	3
3	4
5	5



8. A function is defined over the domain $0 \leq x \leq 600$. Its intercepts are $(600, 0)$ and $(0, 50)$. Draw the function on the grid. Number the x- and y-axes with an appropriate scale. [5]



9. Given $f(x) = \frac{3}{4}x + 3$. [2]

   (a) Find $f(8)$.

   (b) Find$f^{-1}(0)$.

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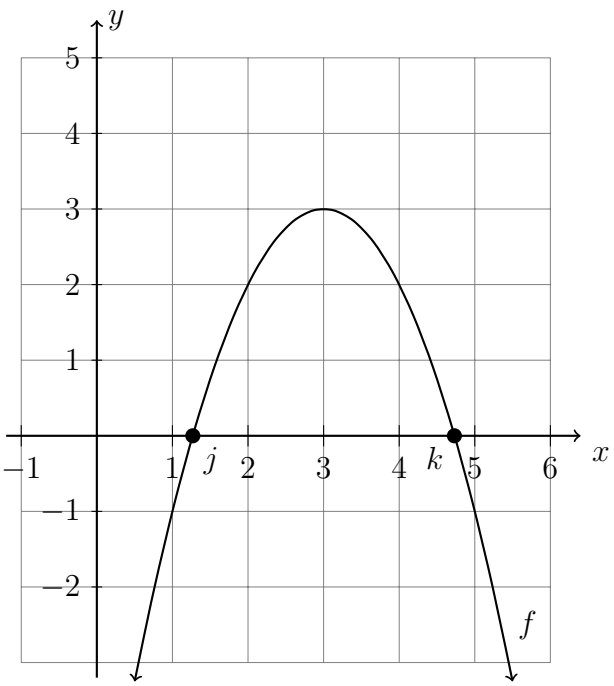
10. The function $f(x) = -x^2 + 6x - 6$ is shown on the graph. [8]

(a) Write down its vertex as an ordered pair.

(b) Draw on the graph the function $g(x) = -x + 4$.

(c) Find the two ordered pairs that satisfy both f and g.



(d) Find the exact values of j and k, the x-intercepts of f. (as an expression with radicals, not a decimal)