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

Quiz: I can model arithmetic sequences

Simple interest: $I = Crt$

1. The rate on a credit card is 15% per annum. Find the interest due on a \$700 purchase after one month. [2]

2. Elizabeth takes out a 6 month loan to purchase and repair a used car for resale. The principal amount is 10,000 British pounds and interest rate is 6.25% per annum. Find the interest Elizabeth pays. [3]

3. Expand the following expressions:

   (a) $\sum_{n=1}^{3}(2n-1) =$ [2]

   (b) $\sum_{n=1}^{5}\frac{1}{n} =$ [2]

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

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

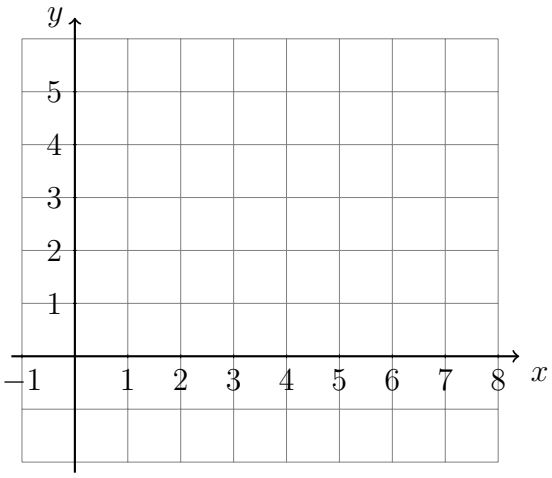
4. Given the linear function $f(x) = -\frac{1}{2}x + 3$. [4]

   (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.

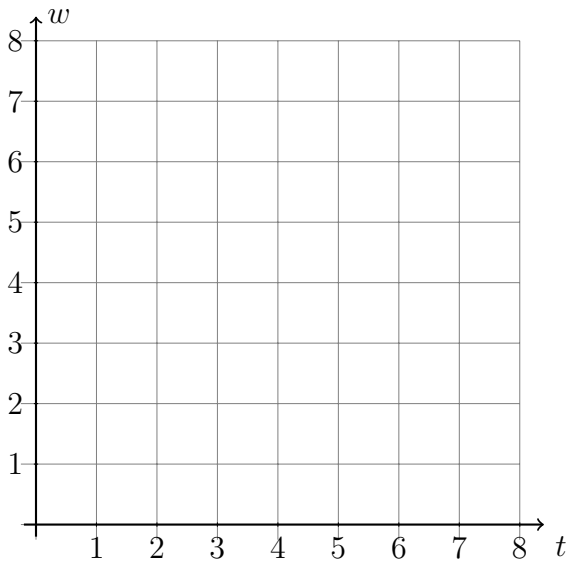


5. The weight of a turkey w in kilograms over a period of time t measured in months is shown in the table. [3]

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

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

t	w
1	4
3	5
4	5
6	6
7	7



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Arithmetic sequences

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

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

6. Given the arithmetic sequence $3, 7, 11, 15, 19, \ldots$ [6]

   (a) Find the common difference d.

   (b) Write down the next term, u_6.

   (c) Find the twelfth term.

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

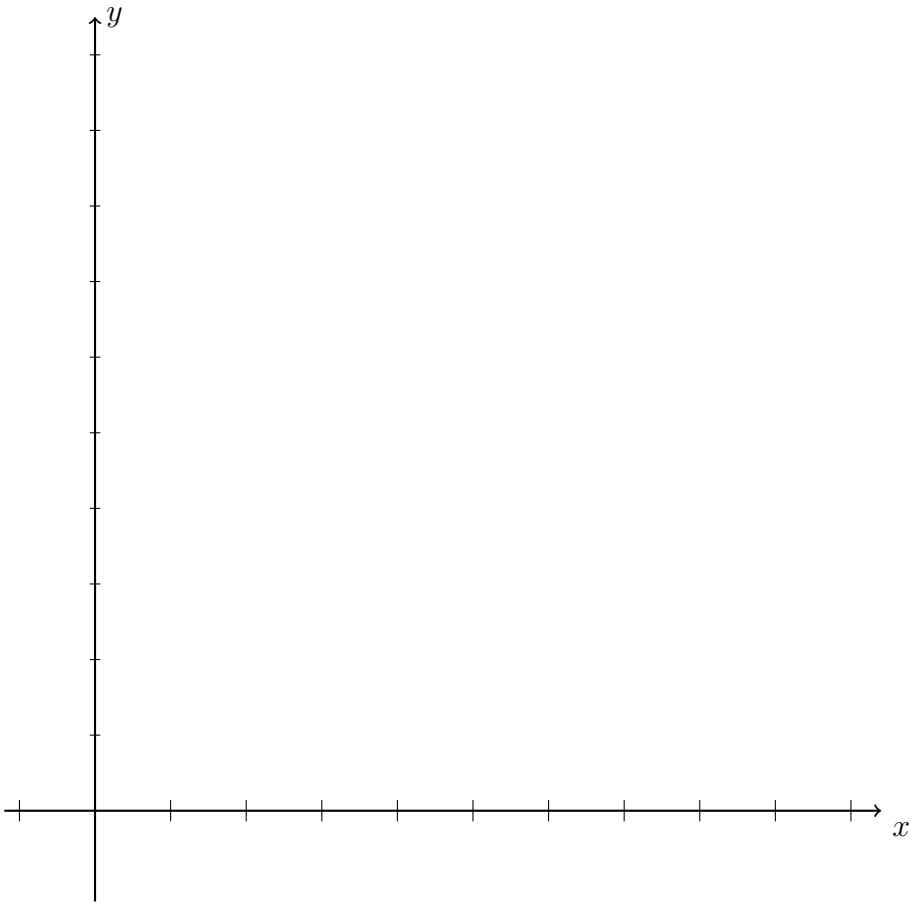
7. In an arithmetic sequence the first term is 7 and the fourth term is 25. [6]

   (a) Find the common difference d.

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

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

8. A function is defined over the domain $0 \leq x \leq 700$. Its intercepts are $(700, 0)$ and $(0, 80)$. Draw the function on the grid. Label and number the x- and y-axes with an appropriate scale. [3]



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9. The second term of an arithmetic sequence is 19 and the sixth term is 7. [6]

   (a) Find the common difference d.

   (b) Find the first term, u_1.

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

10. Given $f(x) = \frac{3}{5}x - 3$. [3]

   (a) Find $f(10)$.

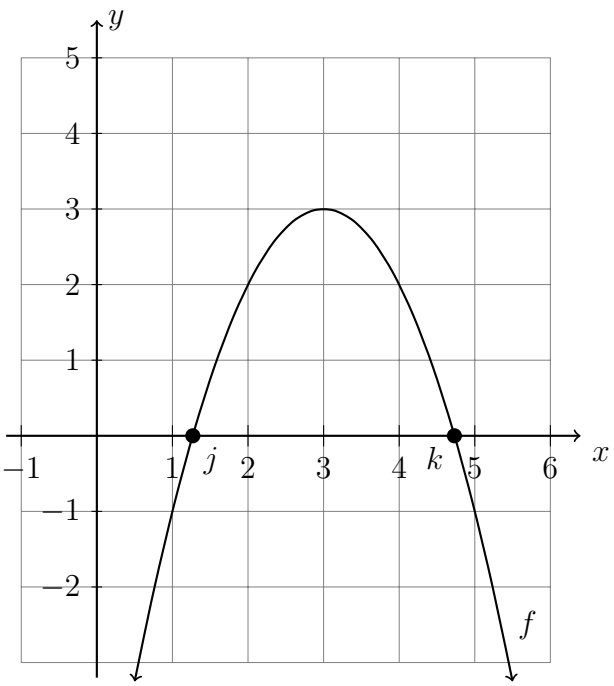
   (b) Find$f^{-1}(0)$.

11. 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)