BECA / IB Math 01-Linear functions Name:
21 December 2021

3.1 Review of linear functions

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

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

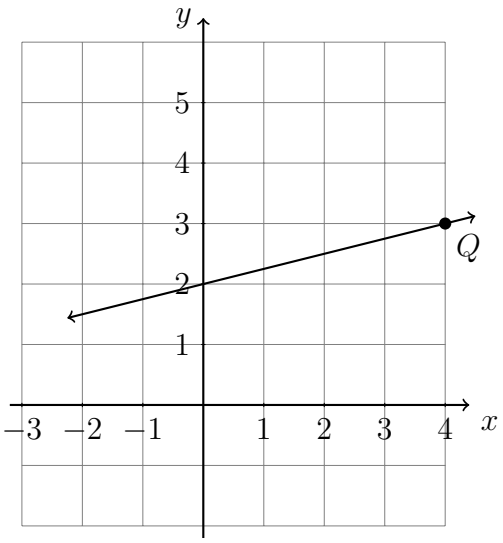
1. A linear function f is graphed below. [4]

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

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

   (c) Write down the equation of the line.

   (d) State the coordinates of the point Q.



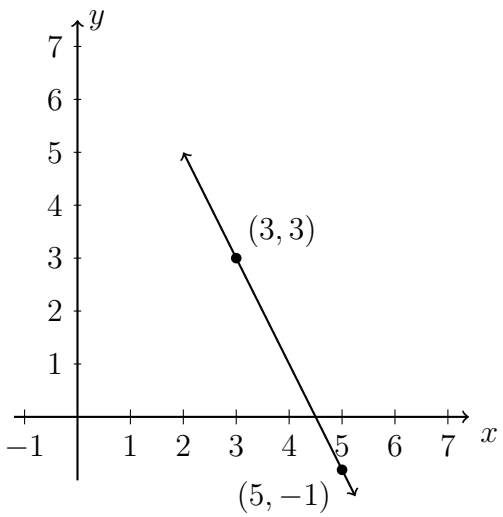
2. Write the linear equation $y - 5 = 3(x + 1)$ in the form $y = mx + c$. [2]

3. A line has a gradient (slope) of $\dfrac{1}{3}$ and passes through the point $(3, 2)$. Find the equation of the line in the form $y = mx + c$. [3]

4. A line goes through the points $(3, 3)$ and $(5, -1)$. [5]

   (a) Find the gradient of the line.

   (b) Find the equation of the line in the form $y = mx + c$.



5. Find the equation of the line through the points $(-2, 5)$ and $(6, 7)$. (in the form $y = mx + c$) [5]

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6. A function f is shown in the table. [5]

x	-3	0	3	6	9
$f(x)$	-1	3	7	11	15

(a) Is f a linear function? Why or why not?

(b) Is f a direct variation? Explain.

(c) Find the gradient of the function.

(d) Write down the equation of f in the form $y = mx + c$

(e) Complete the table of the inverse of f.

x					.
$f^{-1}(x)$					.

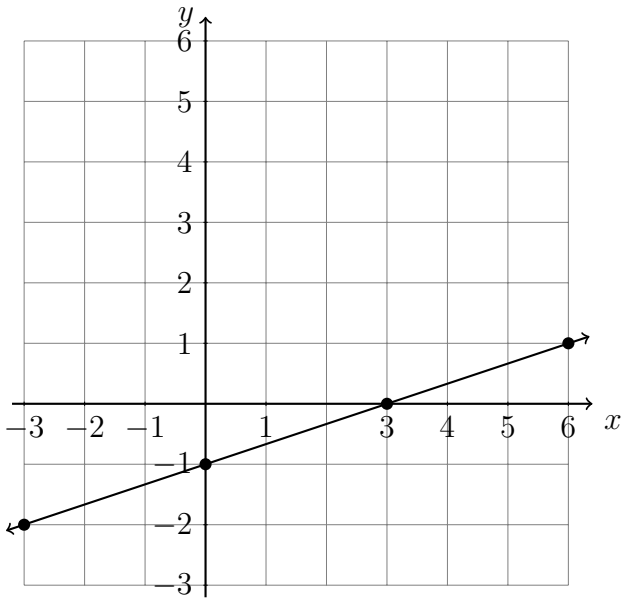
7. A function $f(x) = \frac{1}{3}x - 1$ is graphed below. [3]

   (a) Complete the T-table of values for the function on the left.

   (b) Write down the values for the inverse function in the right T-table.

   (c) Draw the line for the inverse function on the graph.

$f(x)$	
-3	
	-1
3	
6	



$f^{-1}(x)$	

8. Find the inverse function of $f(x) = -\frac{3}{4}x + 6$ using algebraic methods. (state f^{-1} in the form $y = mx + c$) [3]

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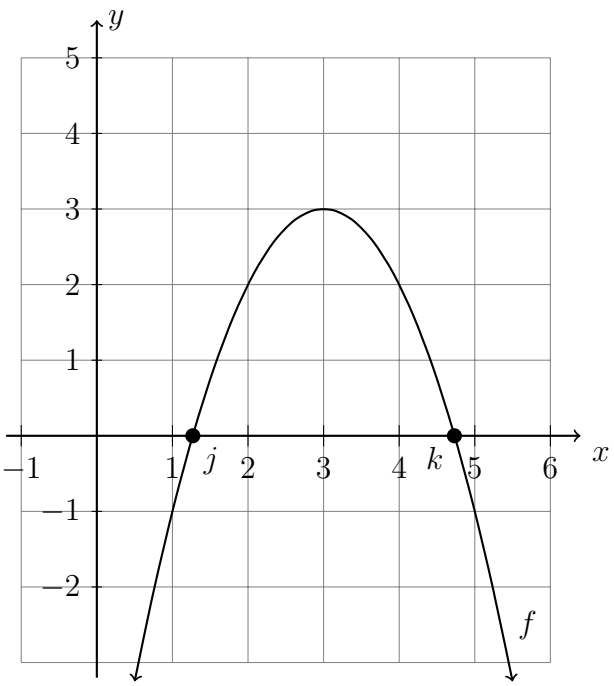
9. The function $f(x) = -x^2 + 6x - 6$ is shown on the graph. [8]



(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)