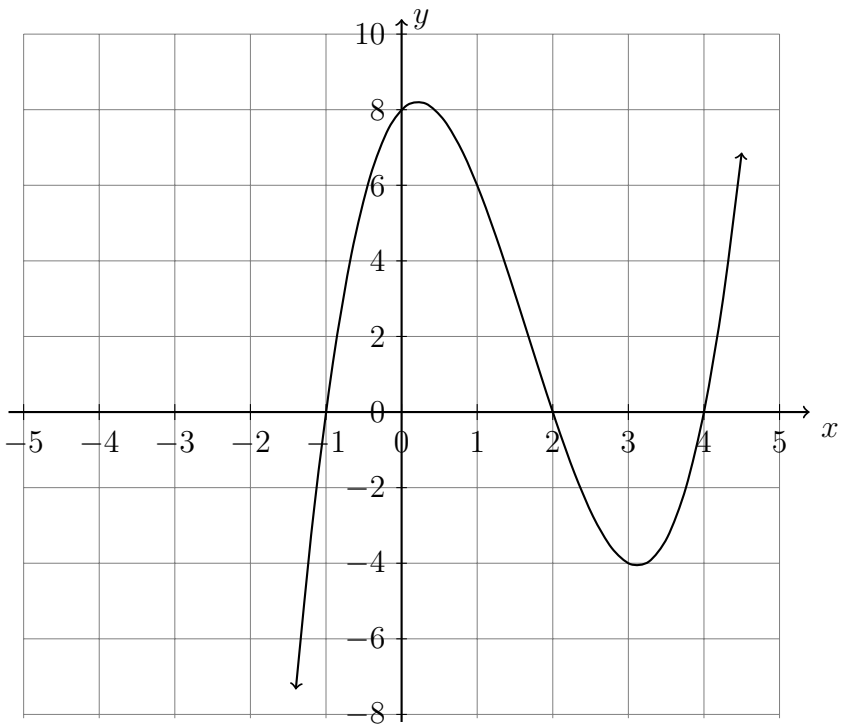
BECA / IB Math 03-Quadratic functions Name:
25 January 2022

4.2 Classwork: Cubic functions

1. Part of the function $f(x) = x^3 - 5x^2 + 2x + 8$ is shown on the graph.



(a) Write down the y-intercept.

(b) Show that $f(0)$ is the y-intercept by substituting $x = 0$ into the function $f(x)$.

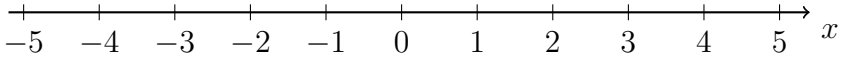
(c) Write down the x-intercepts.

(d) Show that 2 is an x-intercept because $x = 2$ is a solution to $f(x) = 0$.

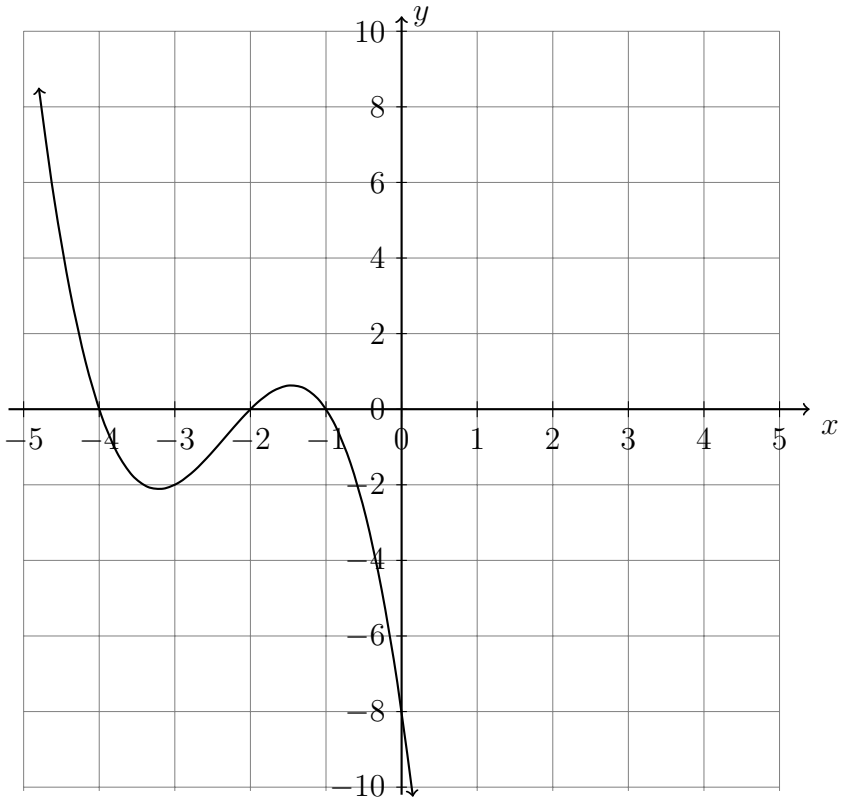
(e) Label the local maximum and local minimum as ordered pairs (approximate the values).

(f) Slope: on the x-axis below, label the portion of the domain where f is increasing with pluses ("+") and decreasing with negative signs ("-"). Mark the extrema (maximum and minimum) with zeros since $f(x)$ is horizontal at those points.

(g) Write down the intervals the function is increasing and decreasing.



2. The function $g(x) = -x^3 - 7x^2 - 14x - 8$ is plotted below.



(a) Write down the y-intercept.

(b) Show that $f(0)$ is the y-intercept by substituting $x = 0$ into the function $f(x)$.

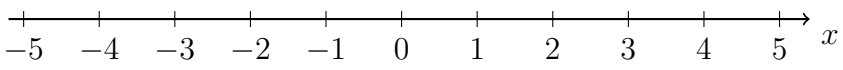
(c) Write down the x-intercepts.

(d) Show that -1 is an x-intercept because $x = -1$ is a solution to $f(x) = 0$.

(e) Label the local maximum and local minimum as ordered pairs (approximate the values).

(f) Slope: on the x-axis below, label the portion of the domain where f is increasing with pluses ("+") and decreasing with negative signs ("-"). Mark the extrema (maximum and minimum) with zeros since $f(x)$ is horizontal at those points.

(g) Write down the intervals the function is increasing and decreasing.



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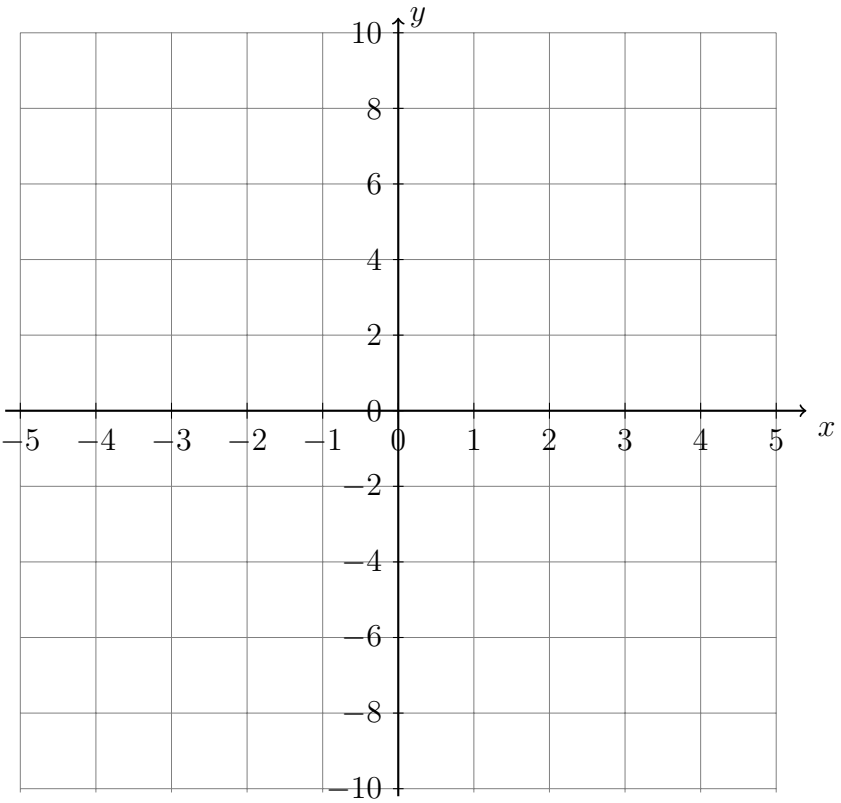
3. Given the function $h(x) = x^3 + 2x^2 - 5x - 6$.

   (a) Write down the y-intercept. Mark it on the plot.

   (b) Show that -1 is an x-intercept because $x = -1$ is a solution to $f(x) = 0$. Mark $(-1, 0)$ on the graph as an x-intercept.

   (c) The other x-intercepts are -3 and $+2$. Mark them on the plot.



   (d) Graph the function on a calculator and, hence, sketch the curve.