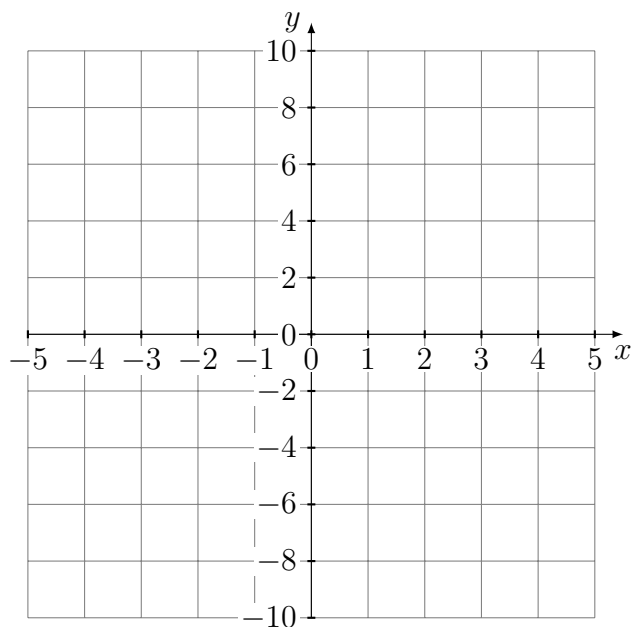
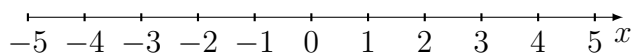


Use pencil for graphs. Label points as ordered pairs.

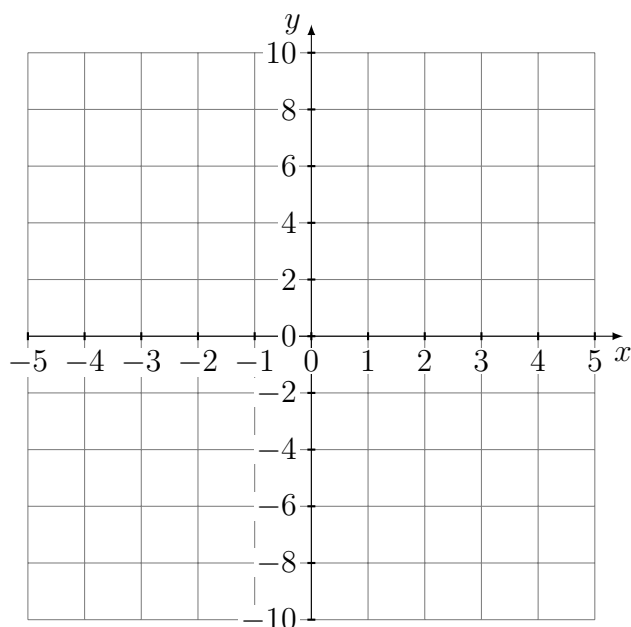
1. The function $f(x) = x^3 - 5x^2 + 2x + 8$ is shown on the graph.



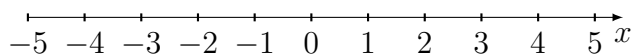
- (a) Write down the y -intercept.
- (b) Show that $f(0)$ is the y -intercept by substituting $x = 0$ into the function $f(x)$.
- (c) Write down the x -intercepts.
- (d) Show that 2 is an x -intercept because $x = 2$ is a solution to $f(x) = 0$.
- (e) What is the end behavior?
 - i. As $x \rightarrow +\infty$ does $y \rightarrow +\infty$ or $-\infty$?
 - ii. As $x \rightarrow -\infty$ does $y \rightarrow +\infty$ or $-\infty$?
- (f) Label the local maximum and local minimum as ordered pairs (approximate the values).
- (g) 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.
- (h) Write down the intervals the function is increasing and decreasing.



2. The function $g(x) = -x^3 - 7x^2 - 14x - 8$ is shown on the graph.

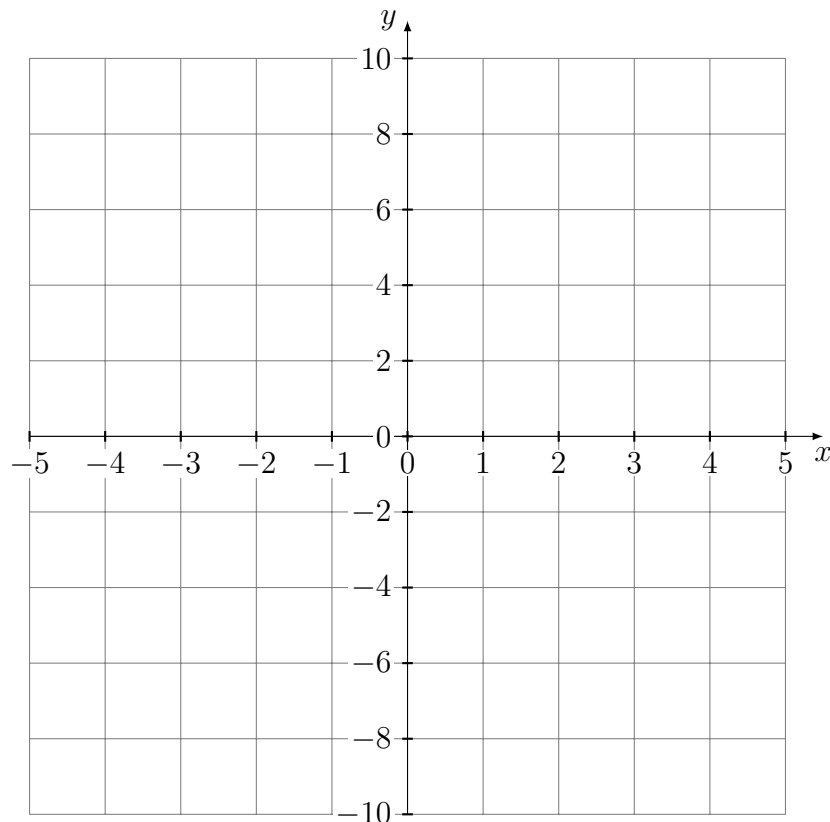


- (a) Write down the y -intercept.
- (b) Show that $f(0)$ is the y -intercept by substituting $x = 0$ into the function $f(x)$.
- (c) Write down the x -intercepts.
- (d) Show that -1 is an x -intercept because $x = -1$ is a solution to $f(x) = 0$.
- (e) What is the sign of the leading coefficient?
What is the end behavior?
 - i. As $x \rightarrow +\infty$ does $y \rightarrow +\infty$ or $-\infty$?
 - ii. As $x \rightarrow -\infty$ does $y \rightarrow +\infty$ or $-\infty$?
- (f) Label the local maximum and local minimum as ordered pairs (approximate the values).
- (g) Slope: on the x -axis below, label the domain as increasing, decreasing, or horizontal (with “+”, “-”, & “0”), and state the respective intervals.



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) What is the sign of the leading coefficient, positive or negative? Hence, what is the function's end behavior?
 - i. As $x \rightarrow +\infty$ does $y \rightarrow +\infty$ or $-\infty$?
 - ii. As $x \rightarrow -\infty$ does $y \rightarrow \infty$ or $-\infty$?
- (e) Using the intercepts and end behavior, sketch the curve.
- (f) Graph the function on a calculator. Is the shape of your sketch approximately correct?

Simplify

4. $(x + 2)(3x - 1)$

5. $(x + 1)(x - 2)(x - 3)$

6. $x^2 \times x^{-2}y^3$

7. $x^5 \div x^2y^3$

8. $\sqrt{x^4y^2z^6}$

The formula for simple interest is $P(t) = P_0(1 + rt)$.

9. What is the value of \$100 in principal at a rate of 4% per annum after one-half year?

10. What is the value of \$250 in principal at a rate of 5.25% per annum after nine months?