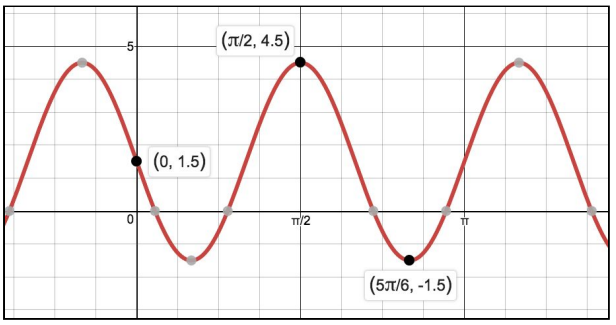
1. **(NA1.7 - R) (CI)** Use the properties of logarithms to write each logarithmic expression as a sum, difference or constant multiple of single logarithms.
   (Cirrito 7.4, p.221)
   a. $log_2(2m)$
   b. $ln\sqrt[5]{x}$
   c. $log_3(a^2b^3)$
   d. $log_{10}[10x(1+r)^t]$
   e. $ln\left(\frac{m^3}{n}\right)$

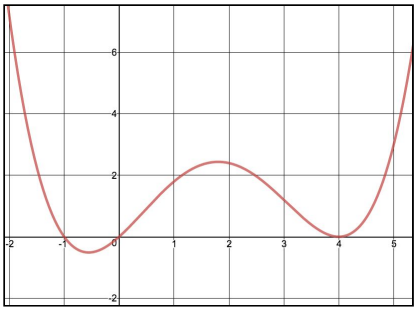
2. **(GT3.7 - R) (CI)** The function, $y = f(x)$ on the domain of $0 \le x \le \pi$, is pictured. Determine:
   (Cirrito 10.3, p337)



   a. the amplitude, the period and the axis of the curve.
   b. an appropriate equation for the function.
   c. the intervals of increase on the domain of $0 \le x \le \pi$.
   d. the exact values of the zeroes on $0 \le x \le \pi$.
   e. where is $\frac{d}{dx}f(x) = 0$?

3. **(F2.5, F2.9 - R) (CI)** A function is defined as $g(x) = e^x - 1$.
   (Cirrito 5.3.3, p136; 5.3.4, p141)
   a. Find the intercept(s) and asymptote(s) of *g*.
   b. Hence, sketch the function.
   c. Mr. S. suggests that $f(x) = ln(x) + 1$ is the inverse of *g*. Simplify the composition $(g\ o\ f)\ (x)$ to see if Mr. S is or is not correct.

4. **(C5.3 - N) (CI)** Here is the graph of the ***derivative*** of a function, $\frac{d}{dx}f(x)$. List what you can figure out about the ***original*** function and then prepare a sketch of the original function.



5. **(SP4.7 - E) (CA)** A discrete random variable *X* has the following probability distribution.
(Cirrito 16.1, p.527)

X	0	1	2	3
$P(X=x)$	0.475	$2k^2$	$\frac{k}{10}$	$6k^2$

a. Find the value of k.
b. Write down $P(X=2)$.
c. Find $P(X=2 \mid X>0)$

6. **(C5.8 - E) (CI)** For $f(x)=2x^3-9x^2+12x-2$, determine:
(Cirrito 20.2, p649)
a. the intervals of increase and decrease of *f*,
b. the maximum and/or minimum values of *f*,
c. the intervals of concavity of *f*,
d. any inflection point(s) of *f*.
e. Then, sketch a graph of *f*. Then use your calculator and graph *f* and compare.

7. **(F2.4, F2.5, C5.4 - E) (CI)** Let $f(x)=1-\frac{3}{x}$ and let $g(x)=x^2-3x$.
(Cirrito 5.4, p.148)
a. Find, if possible, the coordinates of the minimum point(s) of *f* and *g* OR explain why it is not possible.
b. Find the coordinates of the point(s) of intersection of the graphs of *f* and *g*.
c. Find the equation of the inverse function of each function.
d. Find the equations of the line tangent to *g*(*x*) and the line tangent to $f(x)$ at $x=1$.
e. Where do the two tangent lines intersect?

8. **(F2.2, F2.3, C5.1 - E) (CI)** Consider the function $g(x)=\sqrt{x+4}$,
(Cirrito 6.1, 6.2, p.167)
a. Determine the domain and range of $y=g(x)$.
b. The function $y=g(x)$ is now translated 6 units to the left and then horizontally compressed by a factor of 3. Write down the new equation of this transformed function.
c. Determine the equation of $y=g^{-1}(x)$.
d. What is the domain of $y=g^{-1}(x)$?
e. Determine the simplified equation that results from the $\lim_{h\to 0}\frac{g(x+h)-g(x)}{h}$ calculation.
f. Hence or otherwise, determine the rate of change of $y=g(x)$ at the point where $x=12$.