```
> #Q1: Write a function to convert cm to inches (2.54 cm = 1 inch)
  .
> cm2inch:=x->x/2.54;
```

$$cm2inch := x \rightarrow \frac{x}{2.54}$$

```
> cm2inch(5.08);
```

$$2.000000000$$

```
> #Q2: Write a function that takes as input a single integer n and
  outputsthe last digit of 2^n. Call the function on n=10,11,12,
  13,14. Hint: check out the function irem.

> lastdig:=x->irem(2^x,10);
```

$$lastdig := x \rightarrow irem\left(2^{x}, 10\right)$$

```
> lastdig(10);lastdig(11);lastdig(12);lastdig(13);lastdig(14);
```

$$4$$

$$8$$

$$6$$

$$2$$

$$4$$

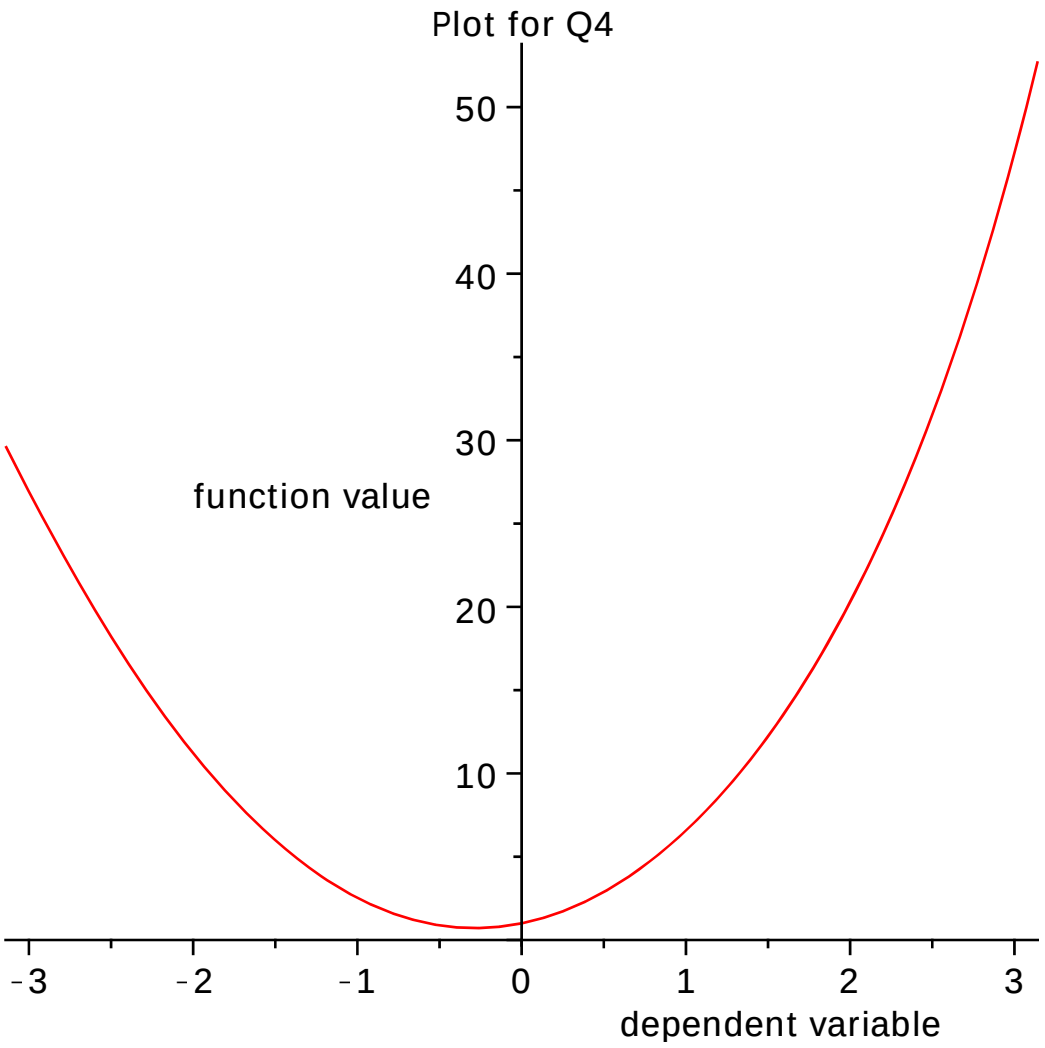
```
> #Q3: Write a function that takes a single real number x as input
  and outputs the value of 3x^2+exp(x)+sin(x).

> q3func:= x->3*x^2+exp(x)+sin(x);
```

$$q3func := x \rightarrow 3\,x^{2} + e^{x} + \sin(x)$$

```
> #Q4: Plot the above function over -Pi <= x <= Pi and label the
  axes. Give a title to the plot (the title does not have to be
  very informative).

> plot(q3func(x),x=-Pi..Pi,labels=["dependent variable","function
  value"],title="Plot for Q4");
```




```
> #Q5: Write a function that takes a single input (an integer n)
  returns the integer 1 if n is prime and 0 otherwise. You will
  only test this function with integers and so no input type
  specification/checking is needed. Call the function with inputs
  23, 871, 873 and 9876543.
```

```
> q5func:=n->piecewise(isprime(n),1,not isprime(n),0);
```

$$q5func := n \rightarrow piecewise(isprime(n), 1, \textbf{not}\ isprime(n), 0)$$

```
> q5func(23);q5func(871); q5func(873); q5func(9876543);
```

$$1$$

$$0$$

$$0$$

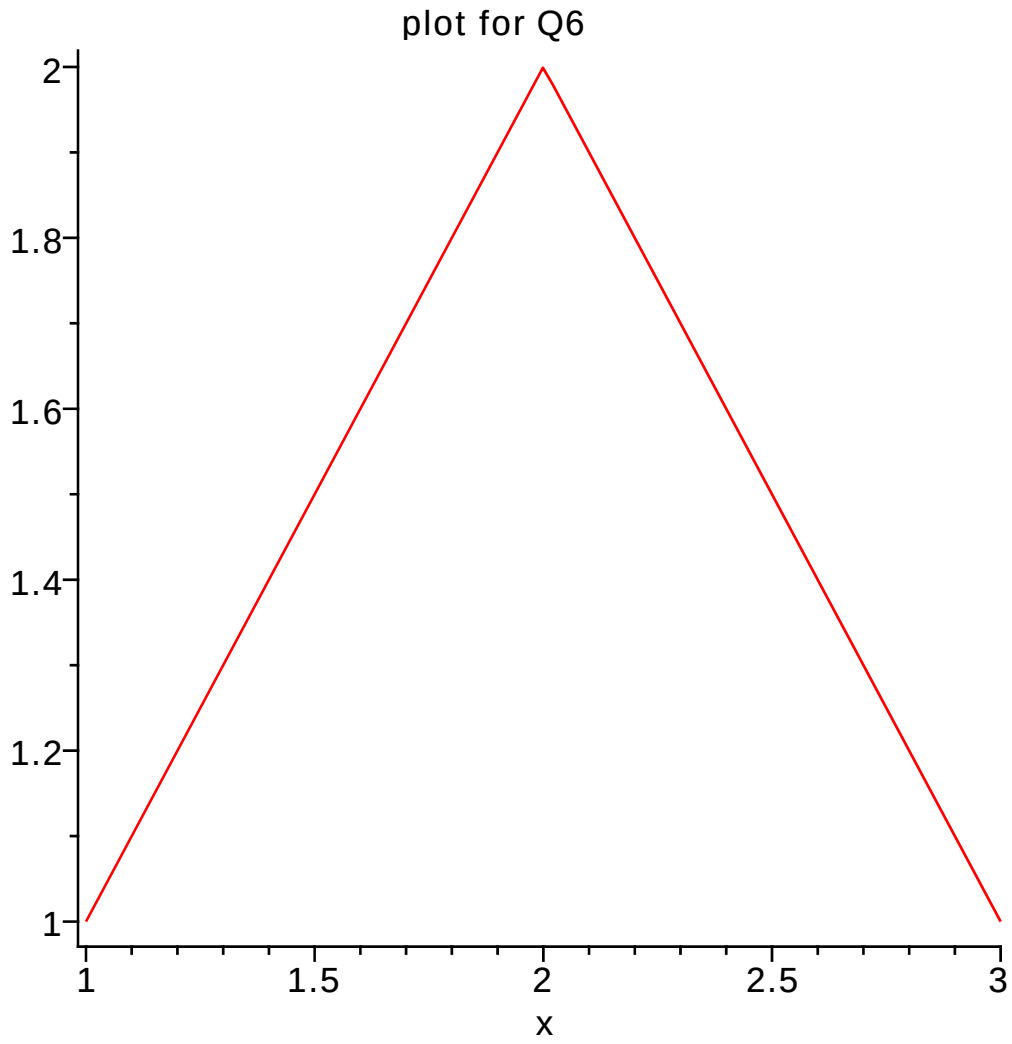
$$0$$

```
> #Q6: In a single plot, draw 2 line segments, one from (1,1) to
  (2,2) and the other from (2,2) to (3,1). Label only the x axis
  (as "x") and give a title to the plot.
```

```
> q6func:=piecewise(1<=x and x<=2,x,2<x and x<=3,4-x);
```

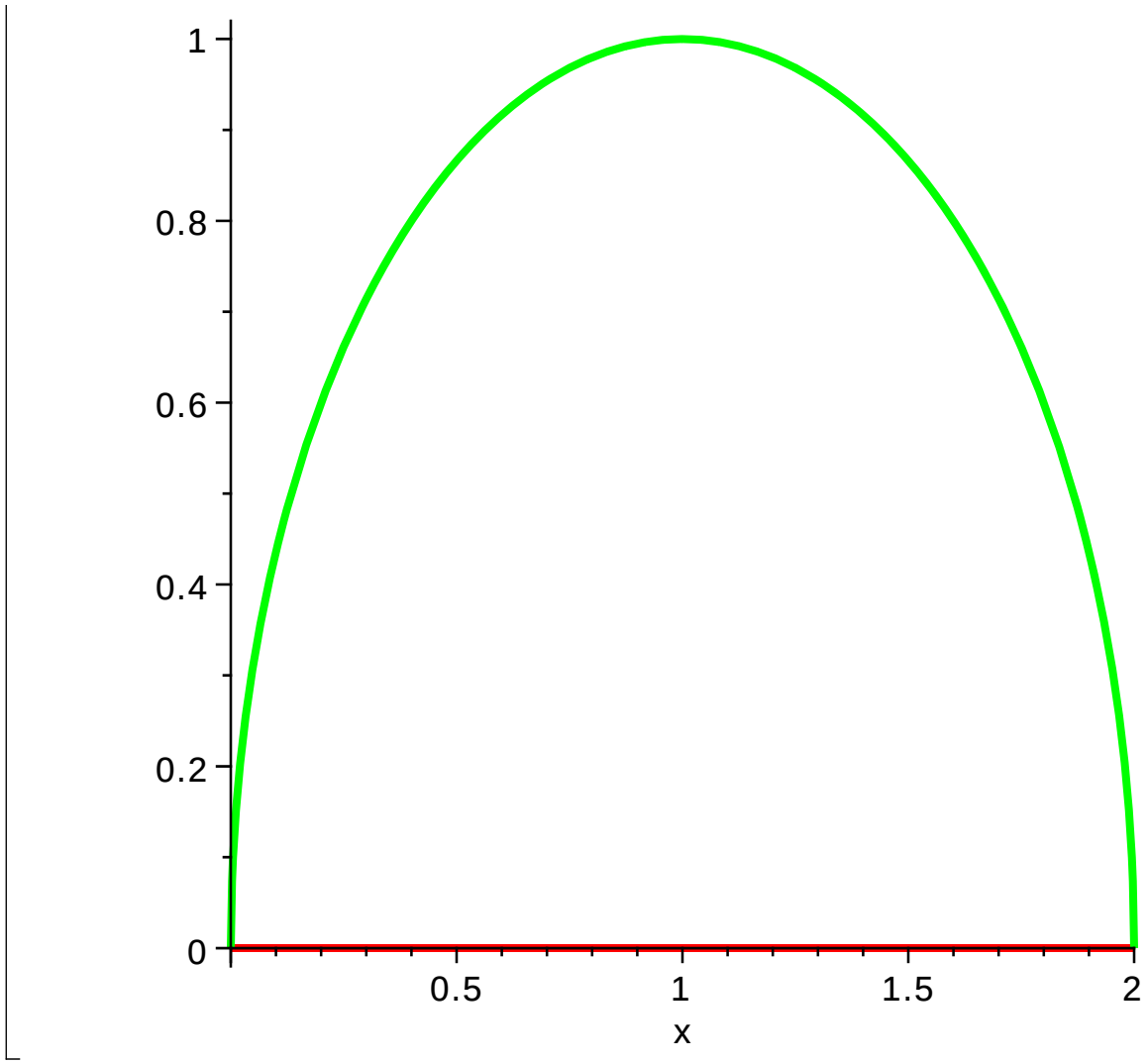
$$q6func := \begin{cases} x & 1 - x \le 0 \text{ and } x - 2 \le 0 \\ 4 - x & -x < -2 \text{ and } x - 3 \le 0 \end{cases}$$

```
> plot(q6func(x),x=1..3,labels=["x",""],title="plot for Q6");
```




```
> #Q7:   In the same plot, draw a semicircle with centre (1,0),
  radius 1 and containing all non-negative y values. Also close
  the semicircle by drawing the diameter that lies on the x axis.
  Use an appropriate color so that the line can be seen on the
  screen.

> plot({sqrt(1-(1-x)^2),0},x=0..2,thickness=3);
```


1
0.8
0.6
0.4
0.2
0
0.5
1
1.5
2
x