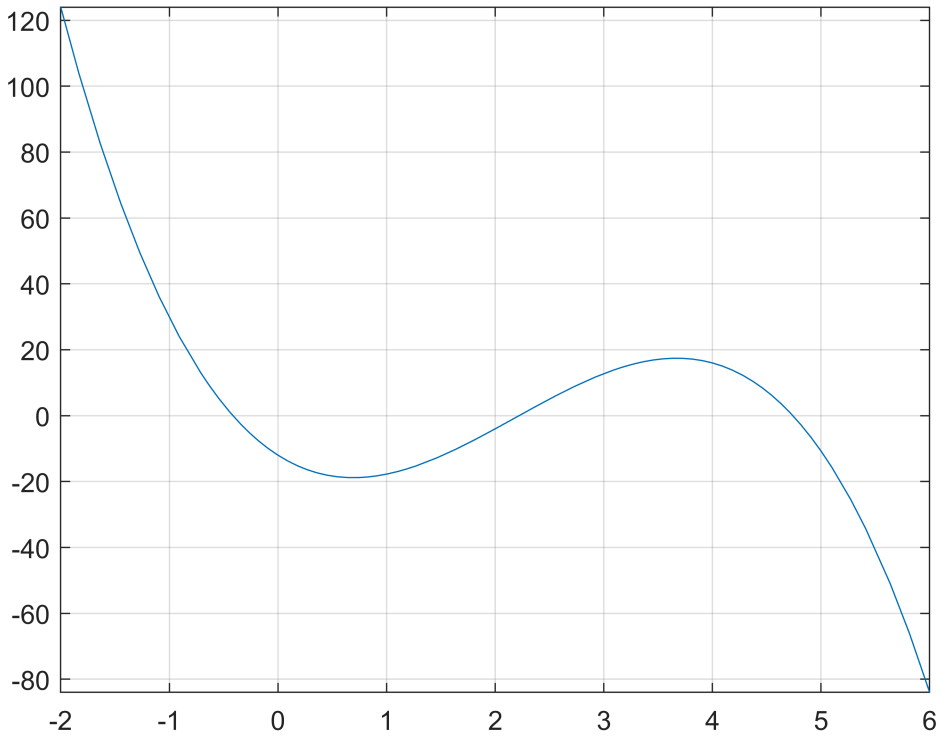
Ejercicios bisección

5.7 Determine the roots of f (x) = −12 − 21*x + 18*x^2 − 2.75*x^3 graphically. In addition, determine the first root of the function with bisection

```
%
f=@(x) -12 -21*x +18*x.^2-2.75*x.^3;
fplot(f,[-2,6]);
grid on;
```




```
%Parece que los ceros están entre los valores de x: (-1,0), (2,3) y (4,5)
```

This plot indicates that roots are located at about –0.4, 2.25 and 4.7. La primera raíz está en [-1,0].

```
%
[x,iteraciones]=bisect(f,-2,6);
x
```

```
x = -0.4147
```

```
iteraciones
```

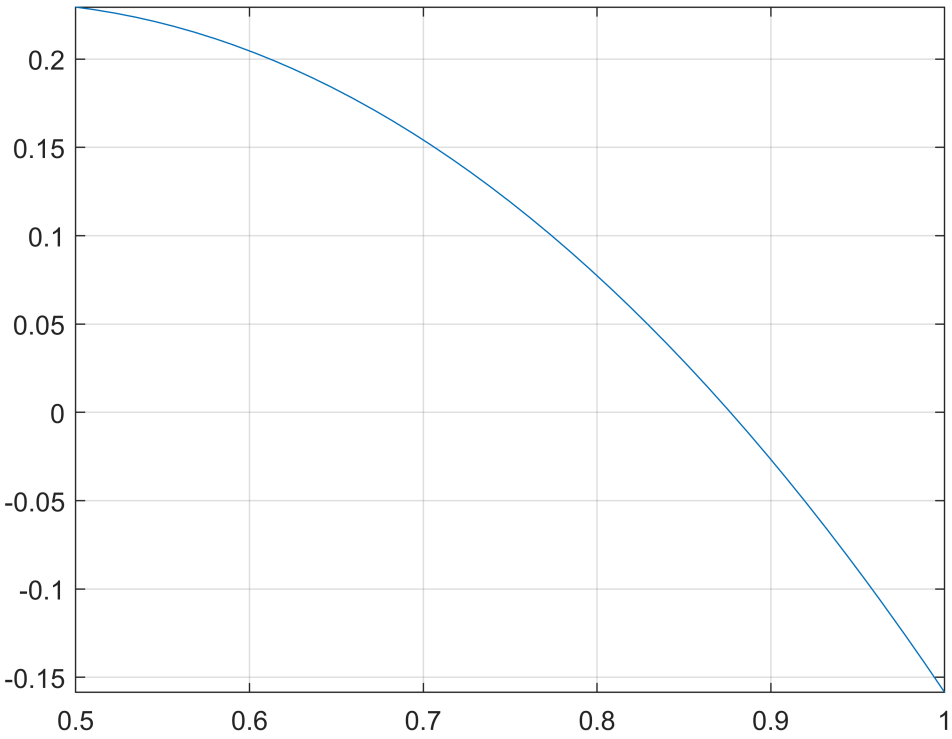
```
iteraciones = 57
```

```

```

5.8 Locate the first nontrivial root of sin(x) = x^2 where x is in radians. Use a graphical technique and bisection.

```
%La trivial es 0. La no trivial está entre 0.5 y 1
f=@(x) sin(x)-x.^2;
fplot(f,[0.5,1]);
grid on;
```




```
[x,iteraciones]=bisect(f,0.5,1);
x
```

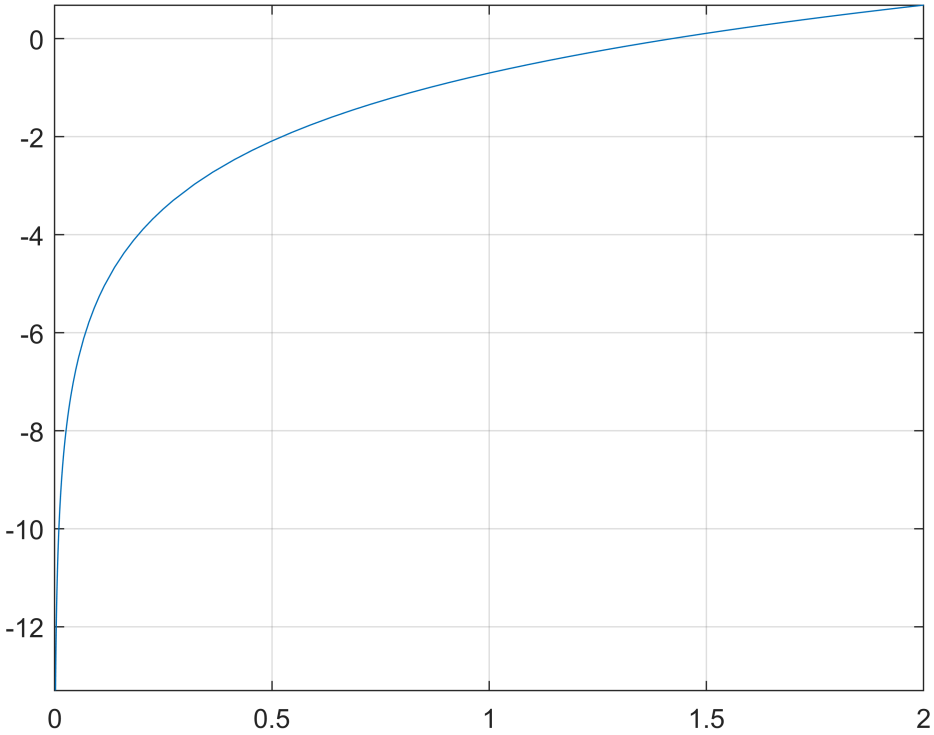
```
x = 0.8767
```

```
iteraciones
```

```
iteraciones = 52
```

5.9 Determine the positive real root of ln(x^2) = 0.7 (a) graphically, (b) using the bisection method, with initial guesses of xl = 0.5 and xu = 2

```
%La solución se encuentra entre 1 y 1.5
f=@(x) log(x.^2)-0.7;
fplot(f,[0,2]);
grid on;
```




```
[x,iteraciones]=bisect(f,1,1.5);
x
```

```
x = 1.4191
```

```
iteraciones
```

```
iteraciones = 51
```

Escribe aquí la función bisección

```
function [x,i]=bisect(f,a,b)
    if f(a)*f(b)>0, error('f(a) y f(b) deben tener distinto signo'), end
    xizq=a;
    xder=b;
    x=(xizq+xder)/2;
    i=1;
    while abs((x-xder)/x)>eps && f(x)~=0
        if f(x)*f(xizq)>0
            xizq=x;
        else
            xder=x;
        end
        i=i+1;
        x=(xizq+xder)/2;
    end
end
```