```
> f:=x -> x^3+Pi^2*x*(sin(x)-cos(x));
```

$$f := x \to x^3 + \pi^2\, x\, (\sin(x) - \cos(x))$$

Common mistake was to write 'evalf(-Pi/2);', which just outputs the value of -Pi/2 in decimal form (-1.57...) instead of
the value of f(-Pi/2), which is what we wanted:

```
> evalf(-Pi/2);
```

-1.570796327

The correct way is :

```
> evalf(f(-Pi/2));
```

11.62735376

Or:

```
> f(-Pi/2);
```

$$\frac{3\,\pi^3}{8}$$

```
> evalf(%);
```

11.62735376

```
> evalf(f(0));
```

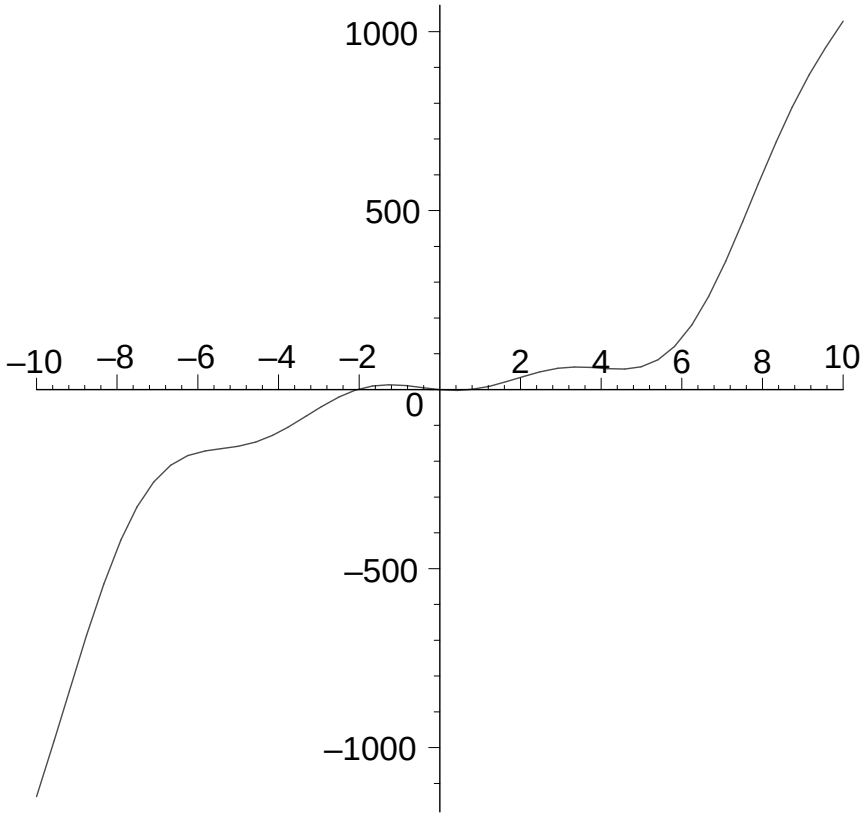
0.

```
> evalf(f(Pi*exp(1)/3));
```

58.11530672

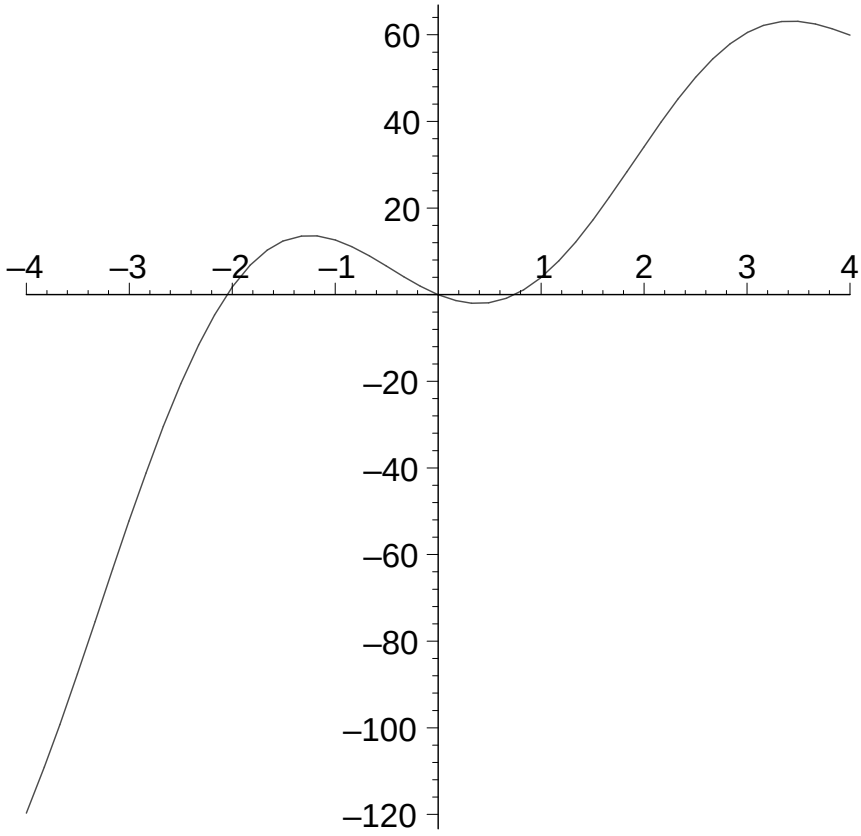
---------- PROBLEM 2 ----------

```
> plot(f);
```



We zoom in on the plot to see better:

```
> plot(f,-4..4);
```



We can clearly see from the above plot that the function has 3 roots (in [-4,4])

```
> f(1/2)*f(2);
```

$$\left(\frac{1}{8}+\frac{1}{2}\pi^2\left(\sin\left(\frac{1}{2}\right)-\cos\left(\frac{1}{2}\right)\right)\right)(8+2\,\pi^2\,(\sin(2)-\cos(2)))$$

```
> evalf(%);
```

-62.85438772

Since f(0.5)f(2)<0 we deduce that the interval (0.5,2) contains the positive root of f.

---------- PROBLEM 3

```
> fsolve(f(x)=0);
```

0.

'fsolve' gave us a root, but we wanted all 3, so now we'll explicitly tell 'fsolve', where to look for the other 2 roots

```
> fsolve(f(x)=0,x=0.5..2);
```

0.7455628165

```
> fsolve(f(x)=0,x=-3..-1);
```

-2.050276315

 ..... and that is the whole Maple lab report that you had to turn in.