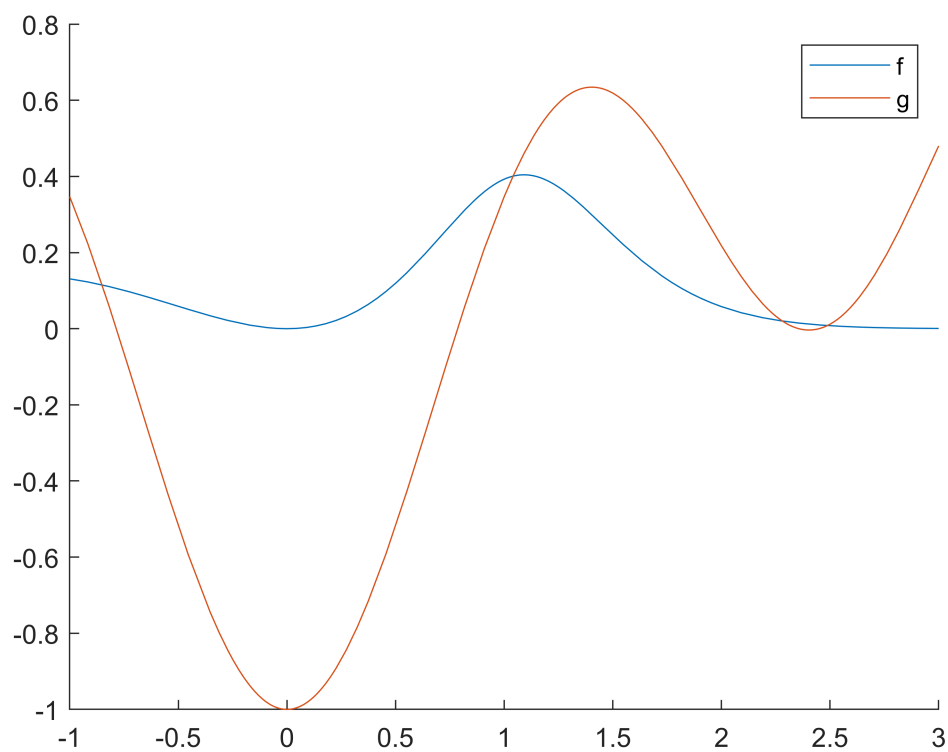


warning off

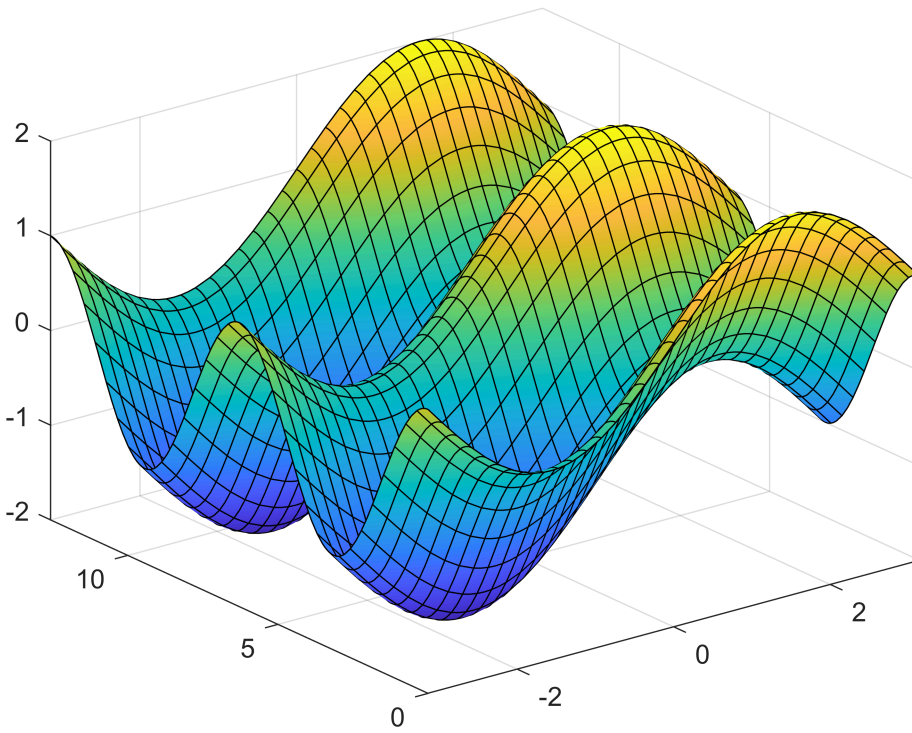
## Esercizio 1

```
f=@(x) x.*atan(x)/(2*(exp(x.^2-1)-x+1));  
g=@(x) (x.^2/6-1)*cos(2*x);  
hold on  
fplot(f,[-1 3])  
fplot(g,[-1 3])  
legend("f","g")
```

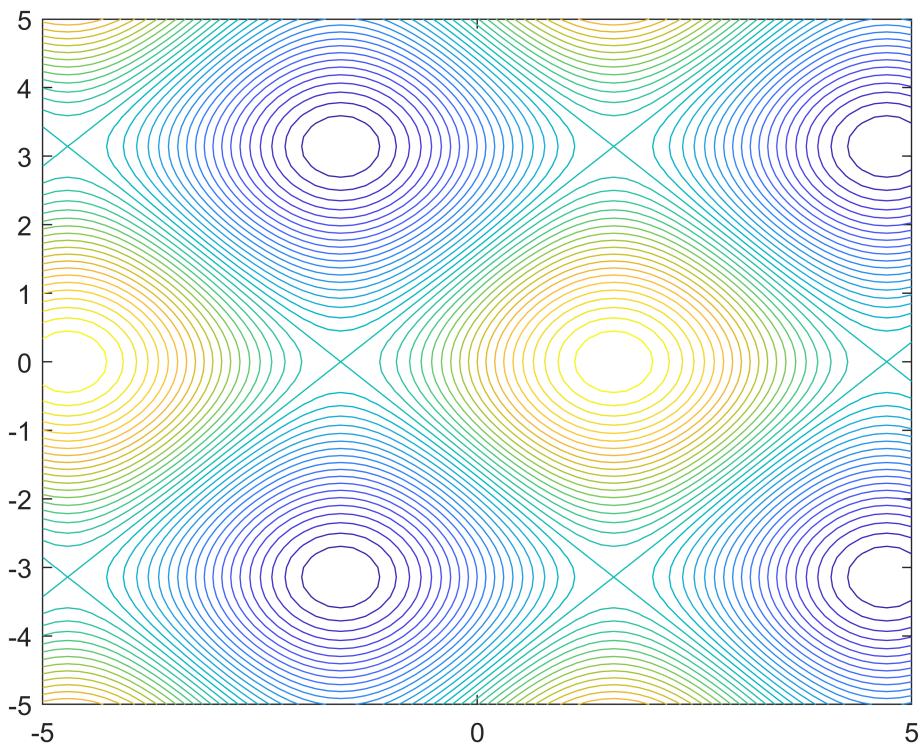


## Esercizio 2

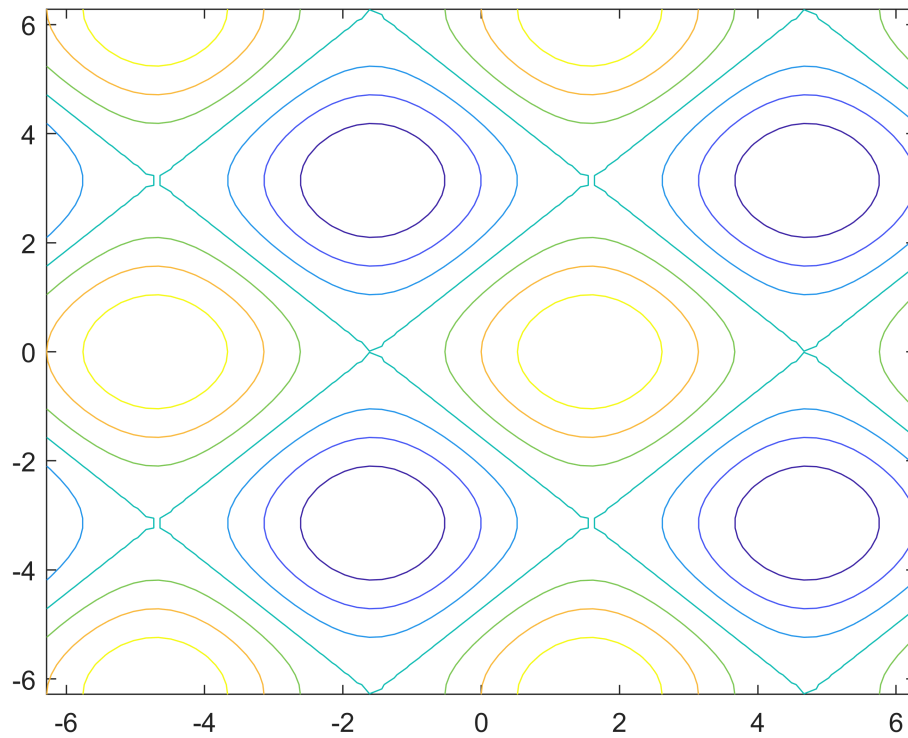
```
figure()  
f=@(x,y) sin(x)+cos(y);  
fsurf(f,[-pi pi 0 4*pi])
```



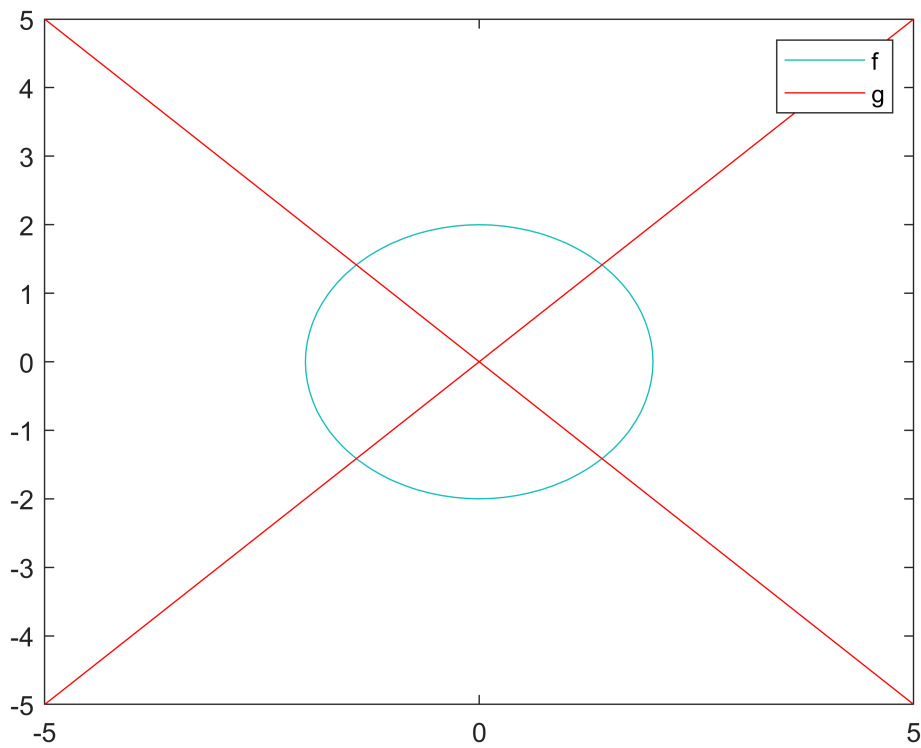
```
fcontour(f, "LevelStep", 0.1)
```



```
fcontour(f,[-2*pi 2*pi])
```



```
f=@(x,y) x.^2+y.^2-4;  
g=@(x,y) x.^2-y.^2;  
fcontour(f,"LevelList",0)  
hold on  
fcontour(g,"LevelList",0,"LineColor","r")  
legend("f","g")
```



### Esercizio 3

```

a=2; b=-3; c=1;
delta=b^2-4*a*c;
if(delta>0)
    x1=(-b+sqrt(delta))/2*a
    x2=(-b-sqrt(delta))/2*a
elseif(delta==0)
    x=b/2*a
else
    "immaginari"
end

```

```

x1 = 4
x2 = 2

```

```

a=4; b=4; c=1;
delta=b^2-4*a*c;
if(delta>0)
    x1=(-b+sqrt(delta))/2*a
    x2=(-b-sqrt(delta))/2*a
elseif(delta==0)
    x=b/2*a
else
    "immaginari"
end

```

```

x = 8

```

```

a=1; b=2; c=2;
delta=b^2-4*a*c;
if(delta>0)
    x1=(-b+sqrt(delta))/2*a
    x2=(-b-sqrt(delta))/2*a
elseif(delta==0)
    x=b/2*a
else
    "immaginari"
end

```

```

ans =
"immaginari"

```

```

alpha=[2 7 12 16.3 17];
for i=1:5
    a=1;
    b=-(10.^alpha(i)+1);
    c=10.^alpha(i);
    delta=b^2-4*a*c;
    if(delta>0)
        x1=(-b+sqrt(delta))/2*a
        x2=(-b-sqrt(delta))/2*a
    elseif(delta==0)
        x=b/2*a
    else
        "immaginari"
    end
end
end

```

```

x1 = 100
x2 = 1
x1 = 10000000
x2 = 1
x1 = 1.0000e+12
x2 = 1
x1 = 1.9953e+16
x2 = 2
x1 = 1.0000e+17
x2 = 0

```

$$\Delta = 10^{2\alpha} + 1 + 2 \cdot 10^\alpha - 4 \cdot 10^\alpha = 10^\alpha (10^\alpha + 2 - 4) = 10^\alpha (10^\alpha - 2) + 1$$

$$x_{1/2} = \frac{2b \pm \sqrt{\Delta}}{2} = \frac{10^\alpha + 1 \pm \sqrt{10^\alpha (10^\alpha - 2) + 1}}{2}$$

$$(10^{2\alpha} - 2 \cdot 10^\alpha + 1) = (1 - 10^\alpha)^2$$

$$x_1 = 1$$

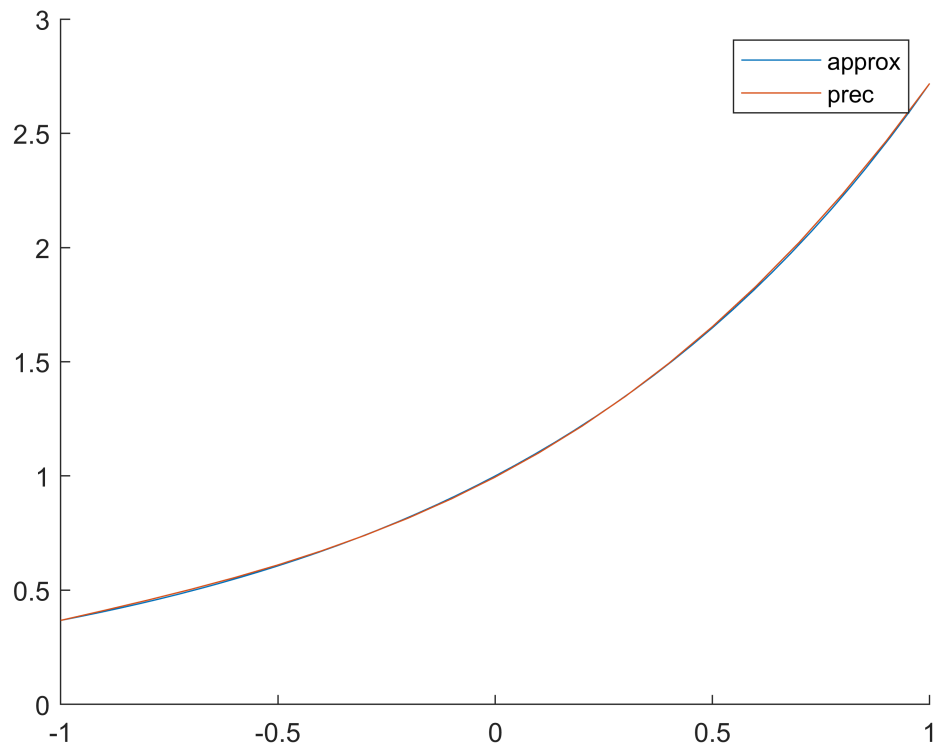
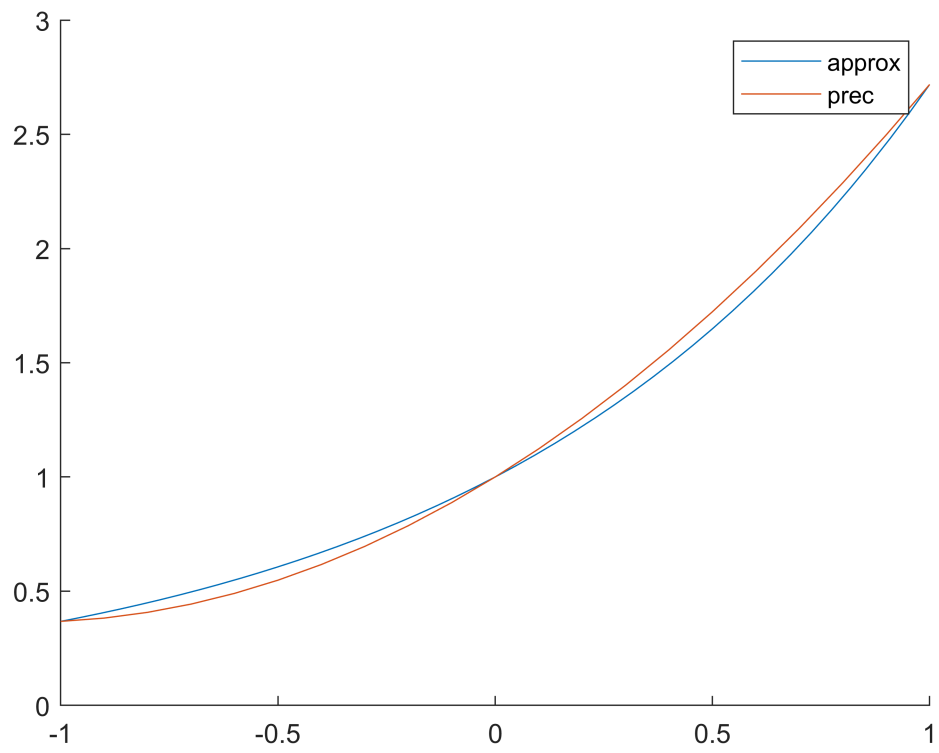
$$x_2 = 10^\alpha$$

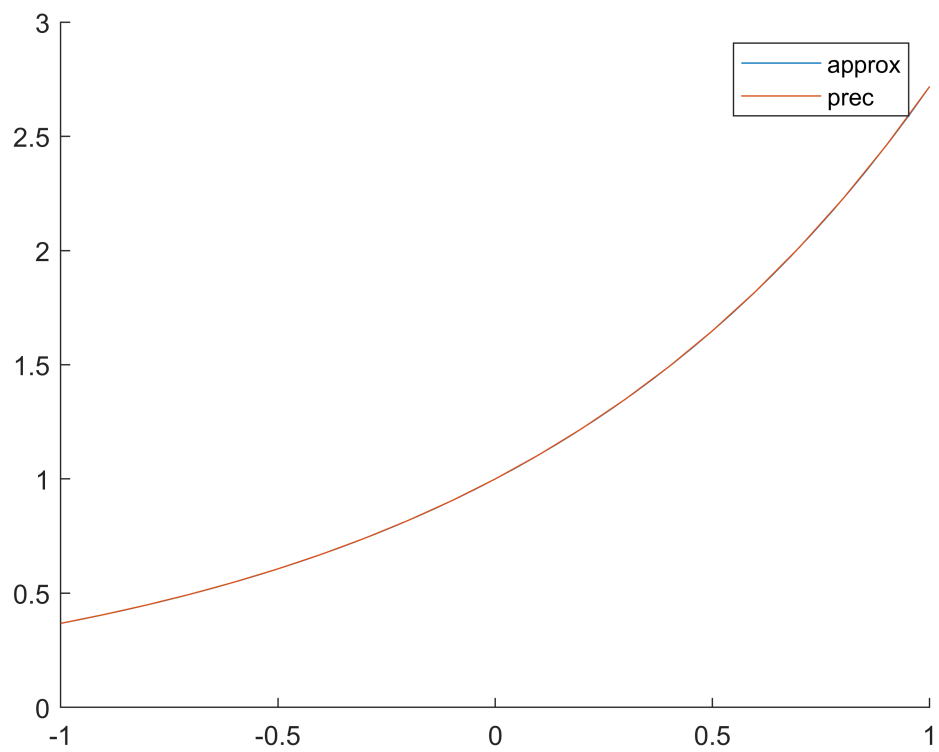
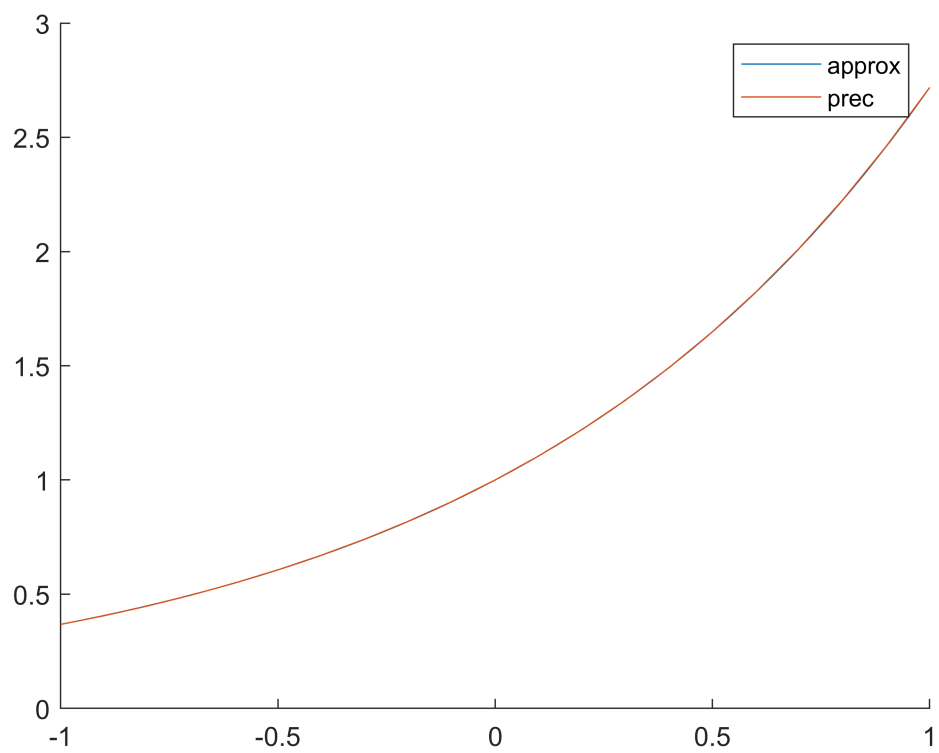
Gli errori di calcolo possono essere imputati alle approssimazioni di calcolo eseguite dal computer.

Esercizio 4 lezione

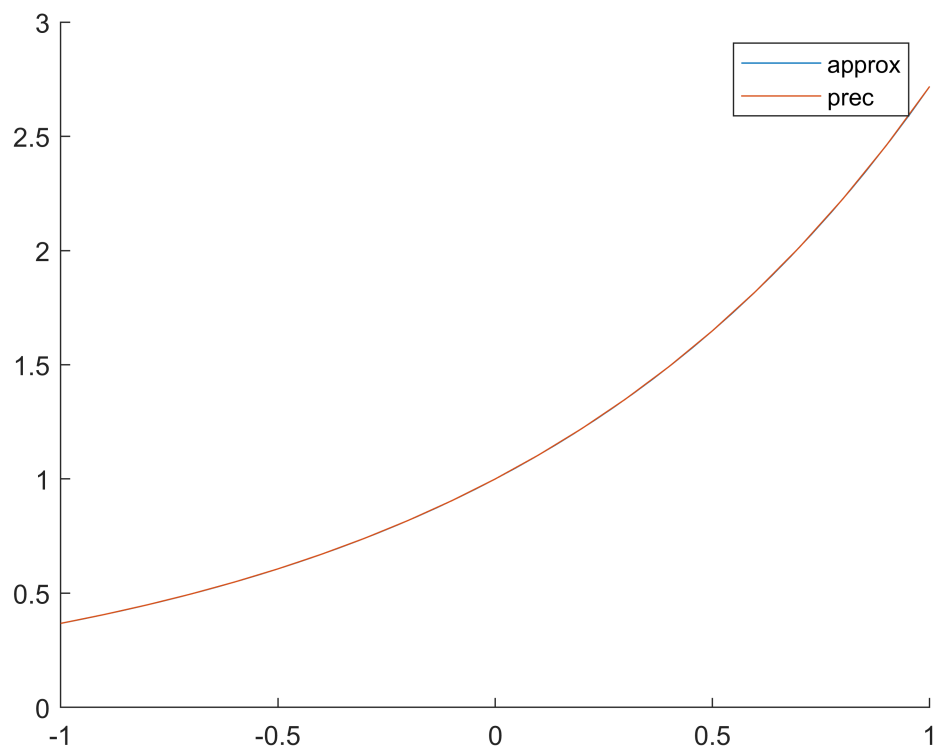
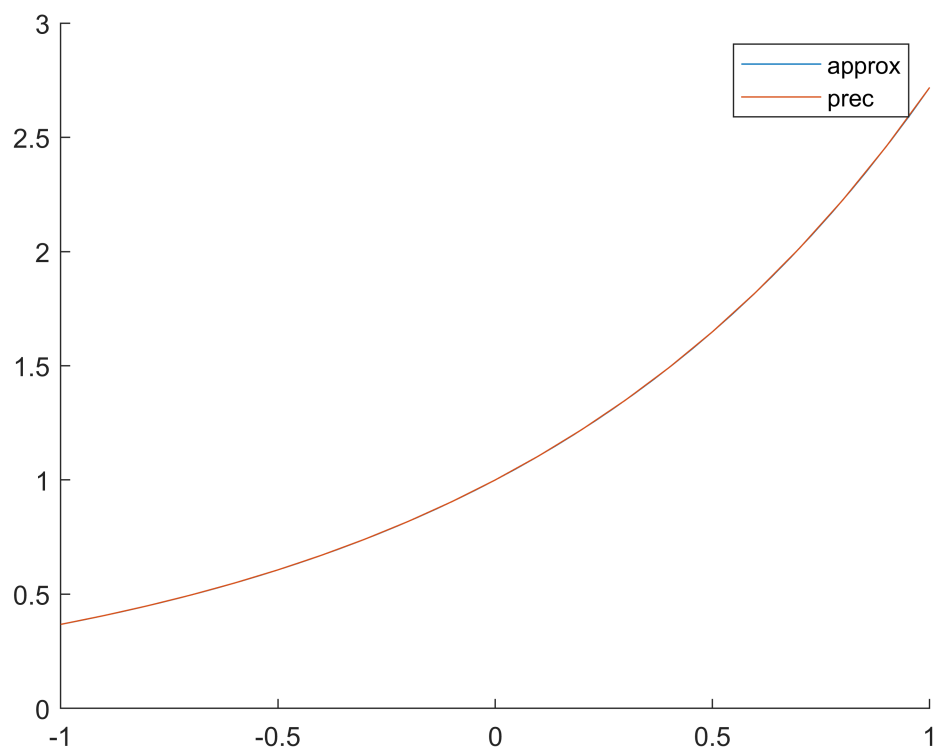
```
f=@(x) exp(x);
N=100;
n=linspace(-1,1,N);
fn=f(n);
for i=2:1:12
    figure()
    hold on
    fplot(f,[-1 1])
    x=linspace(-1,1,i+1);
    y=f(x);
    p=polyfit(x,y,i);
    x1=-1:0.1:1;
    y=polyval(p,x1);
    plot(x1,y)
    for c=1:1:N
        e(c)=abs(fn(i)-polyval(p,n(i)));
    end
    err1(i-1)=max(e);
```

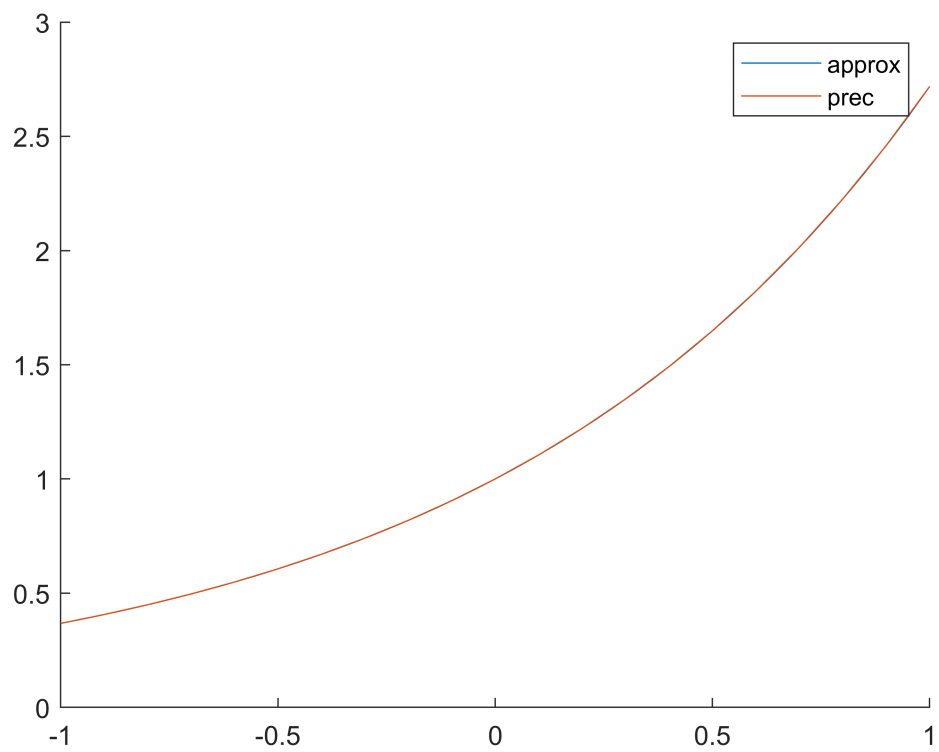
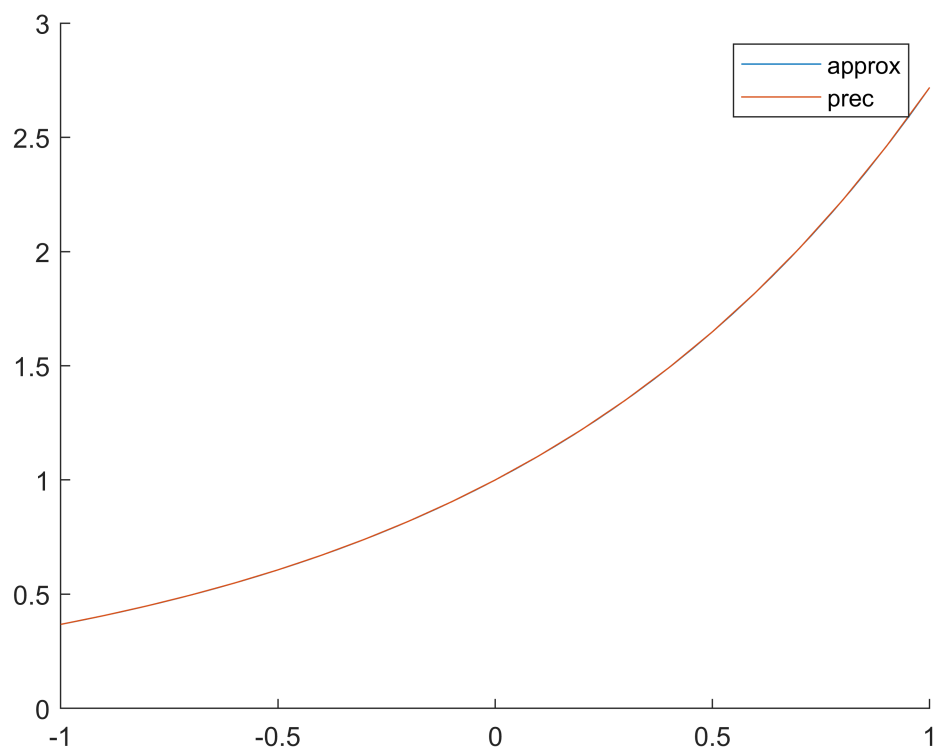
```
legend("approx","prec")  
end
```

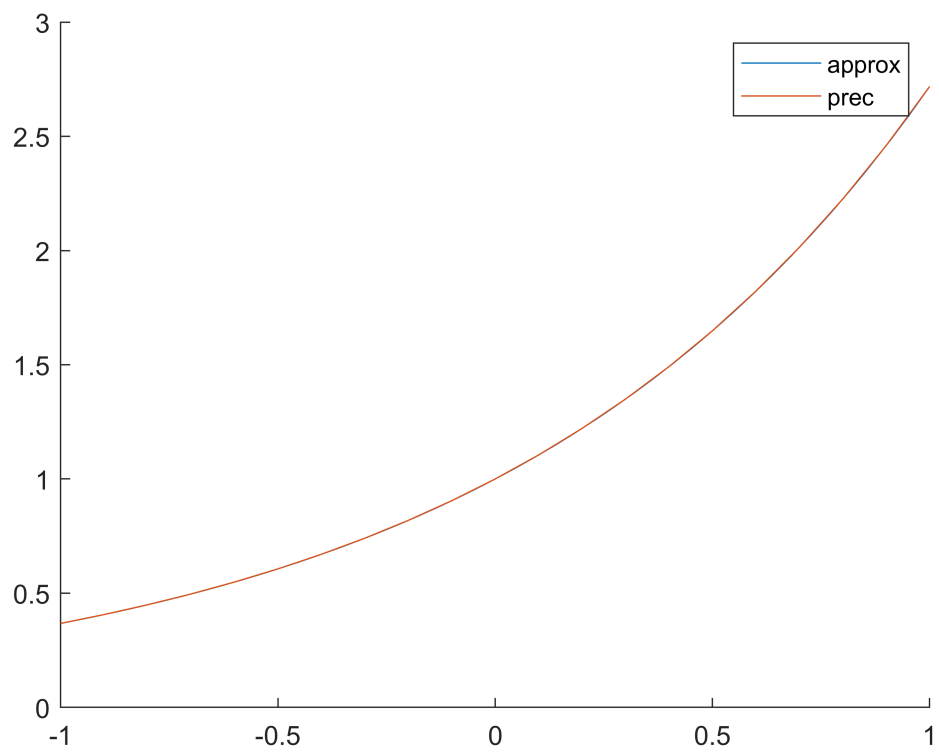
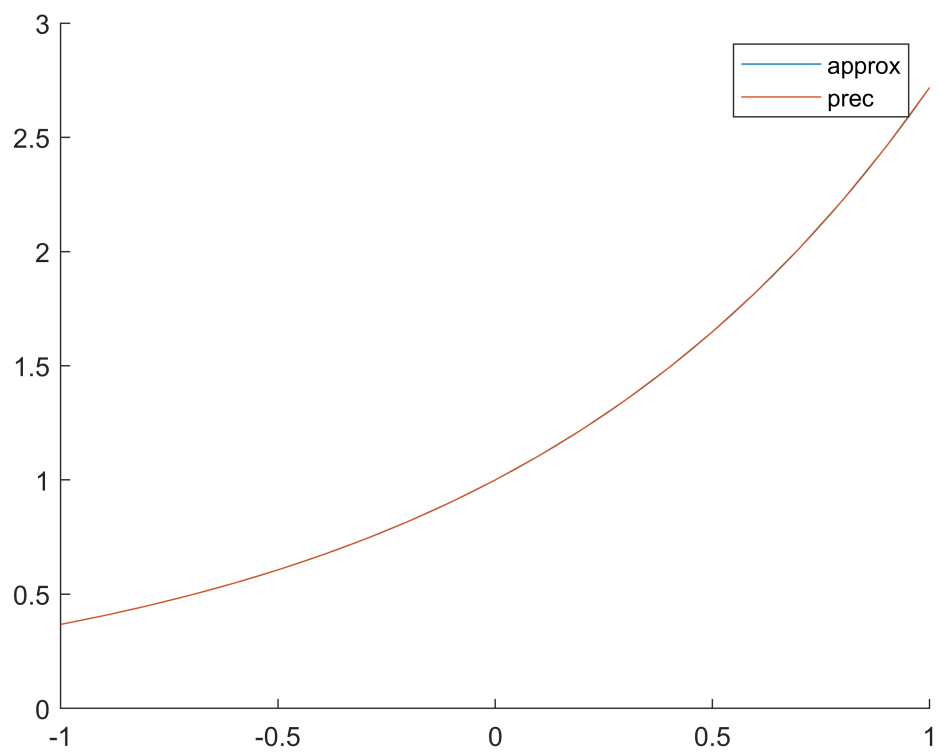


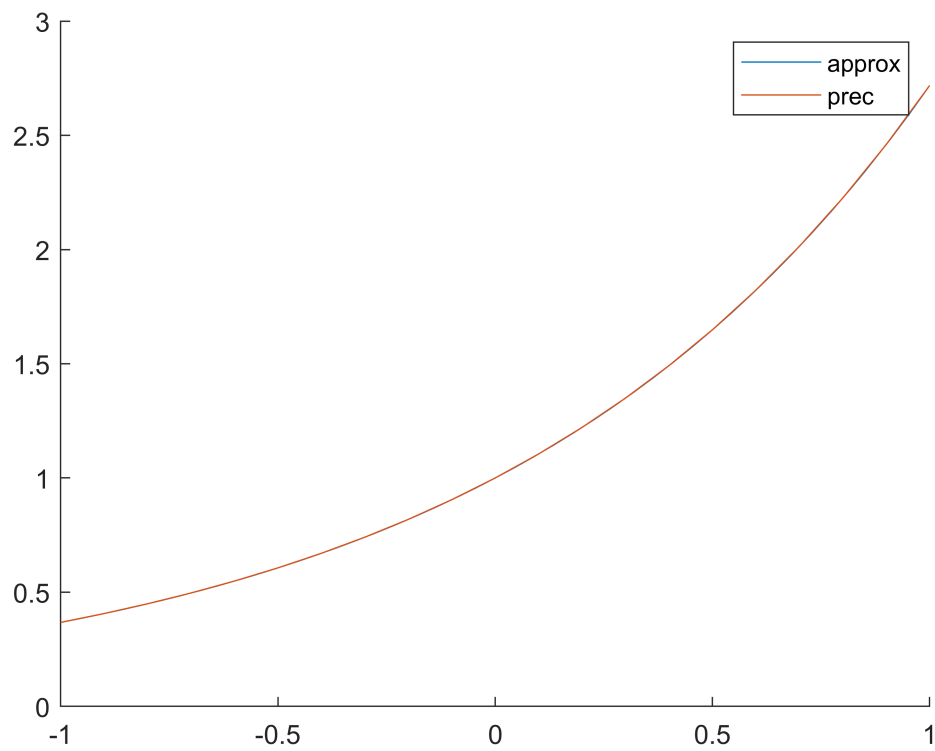












```
figure()  
semilogy(2:12,err1,"or")
```

