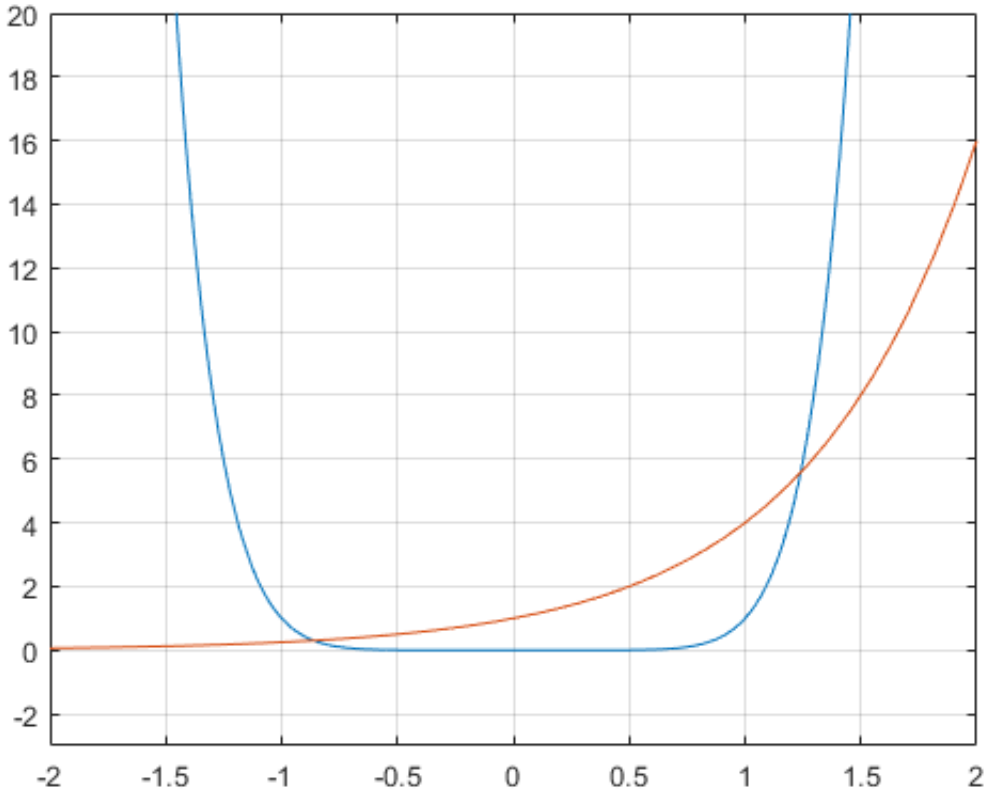
```
%Gino Rospigliosi
%Matlab Project A
%Section:0423
%TA:Thien Ngo
```

```
%Problem 5:
syms x;
fplot(x^8,[-2 2])
hold on
fplot(4^x,[-2 2])
grid;
ylim([-3 20]);
hold off
func=@(x)(x^8-4^x);
fzero(func,-1)
fzero(func,1.25)
```

```
ans =

   -0.8613


ans =

    1.2396
```




```
%Problem 7:
```

```
%Part a:
syms x;
diff((x^3)/(x^2+1))
```

```
ans =

(3*x^2)/(x^2 + 1) - (2*x^4)/(x^2 + 1)^2
```

```
%Part c:
syms x;
diff(diff(diff(atan(x))))
```

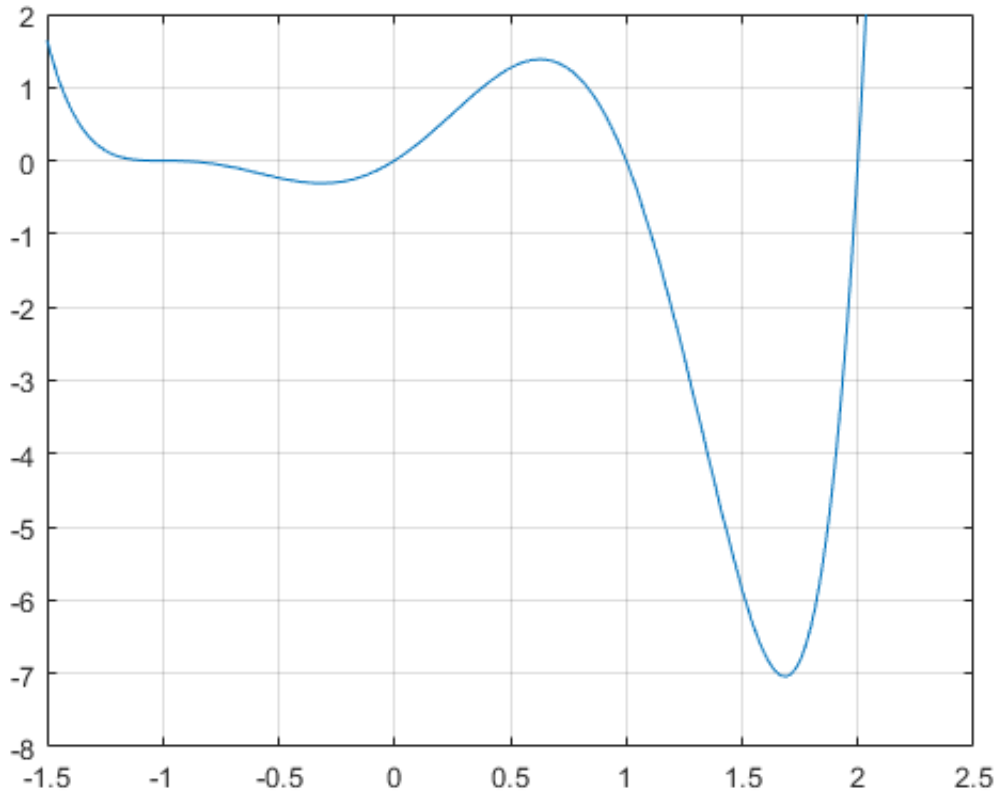
```
ans =

(8*x^2)/(x^2 + 1)^3 - 2/(x^2 + 1)^2
```

```
%Part e:
syms x;
diff((exp(1))^(x*log(x)))
```

```
ans =

(3060513257434037/1125899906842624)^(x*log(x))*log(3060513257434037/1125899906842624)*(log(x)
 + 1)
```

```
%Problem 10:
```

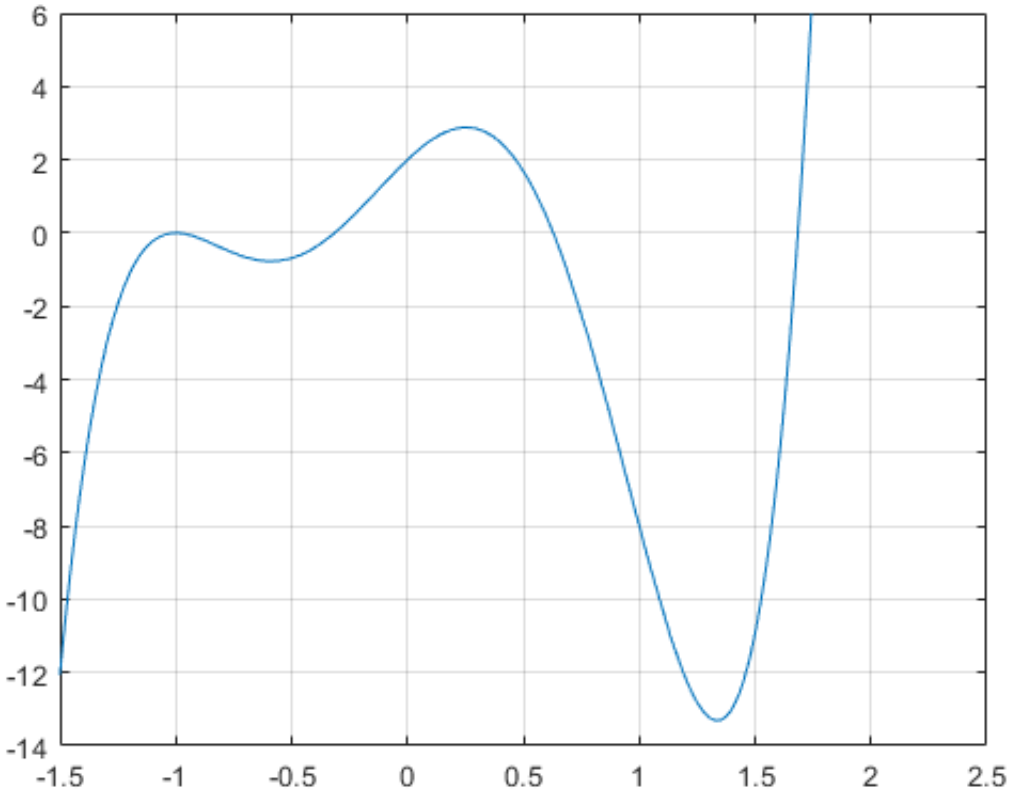
```
%Part a:
syms t;
fplot(t^6-4*t^4-2*t^3+3*t^2+2*t)
grid;
xlim([-3/2 5/2]);
ylim([-8 2]);
```



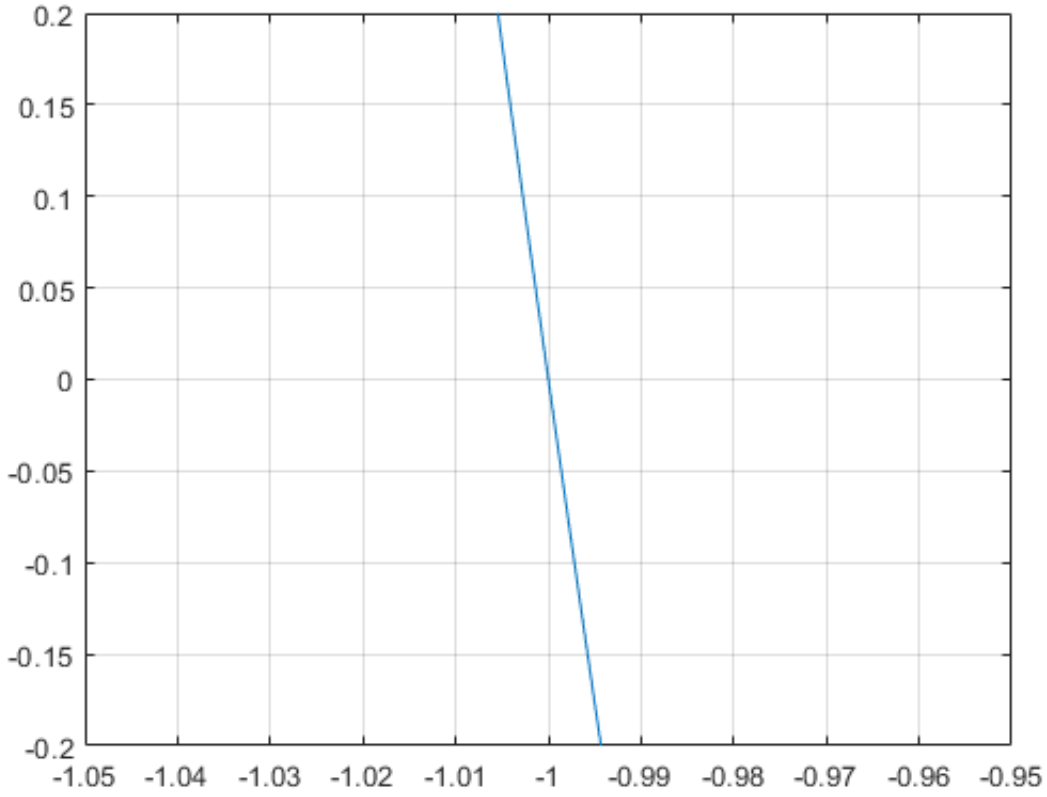

```
%Part b:
%There appear to be four local max and min on the graph of f(t).
```

```
%Part c:
syms t;
fplot(diff(t^6-4*t^4-2*t^3+3*t^2+2*t))
grid
xlim([-3/2 5/2]);
ylim([-14 6]);
%There are four points where f'(t) = 0. These values appear to occur near
%where t = -1, t = -0.3, and t = 0.6, t = 1.5.
diff(t^6-4*t^4-2*t^3+3*t^2+2*t);
func = @(t)(6*t^5-16*t^3-6*t^2+6*t+2);
fzero(func,-1)
fzero(func,-0.3)
fzero(func,0.6)
fzero(func,1.5)
```

```
ans =

    -1


ans =

   -0.3143


ans =

    0.6296


ans =

    1.6847
```

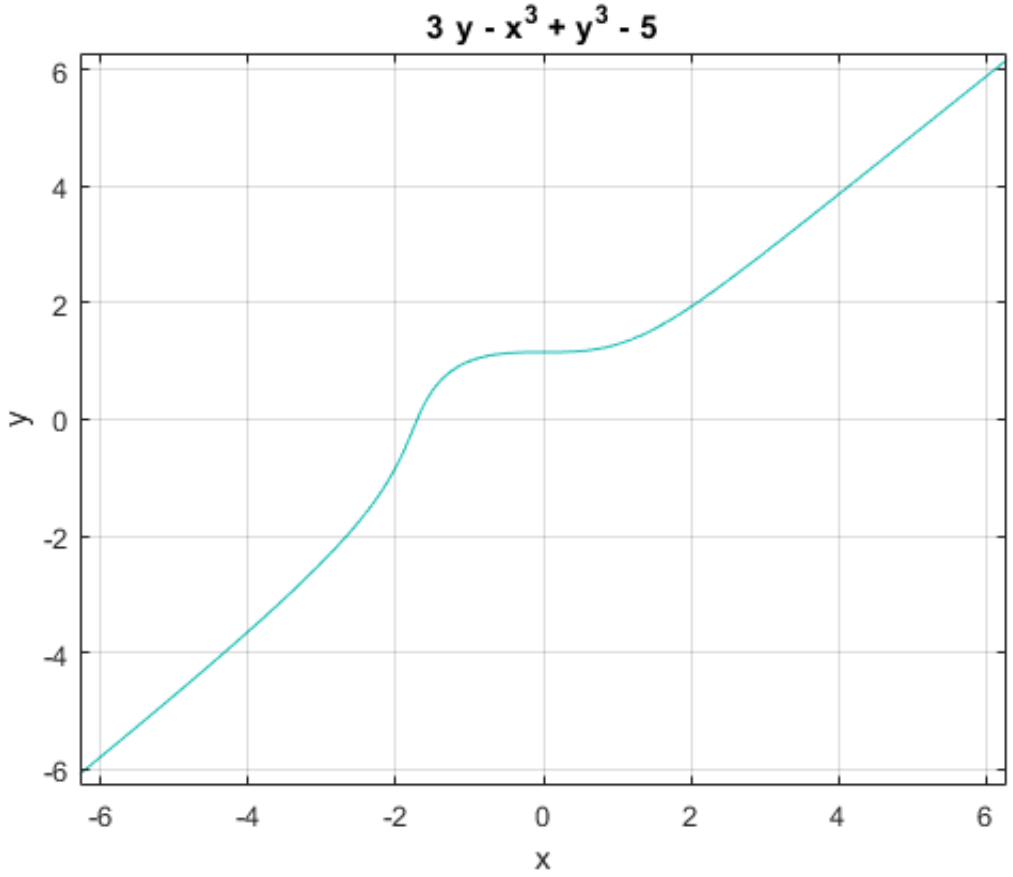



```
%Part d:
syms t;
fplot(diff(diff(t^6-4*t^4-2*t^3+3*t^2+2*t)))
grid;
xlim([-1.05 -0.95]);
ylim([-0.2 0.2]);
%Due to the fact that f''(t) > 0 when t < -1 and f''(t) < 0 when t > -1,
%t = -1 is an inflection point on the graph of f(t) because f(t) changes
%concavity from concave up to concave down at t = -1.
```

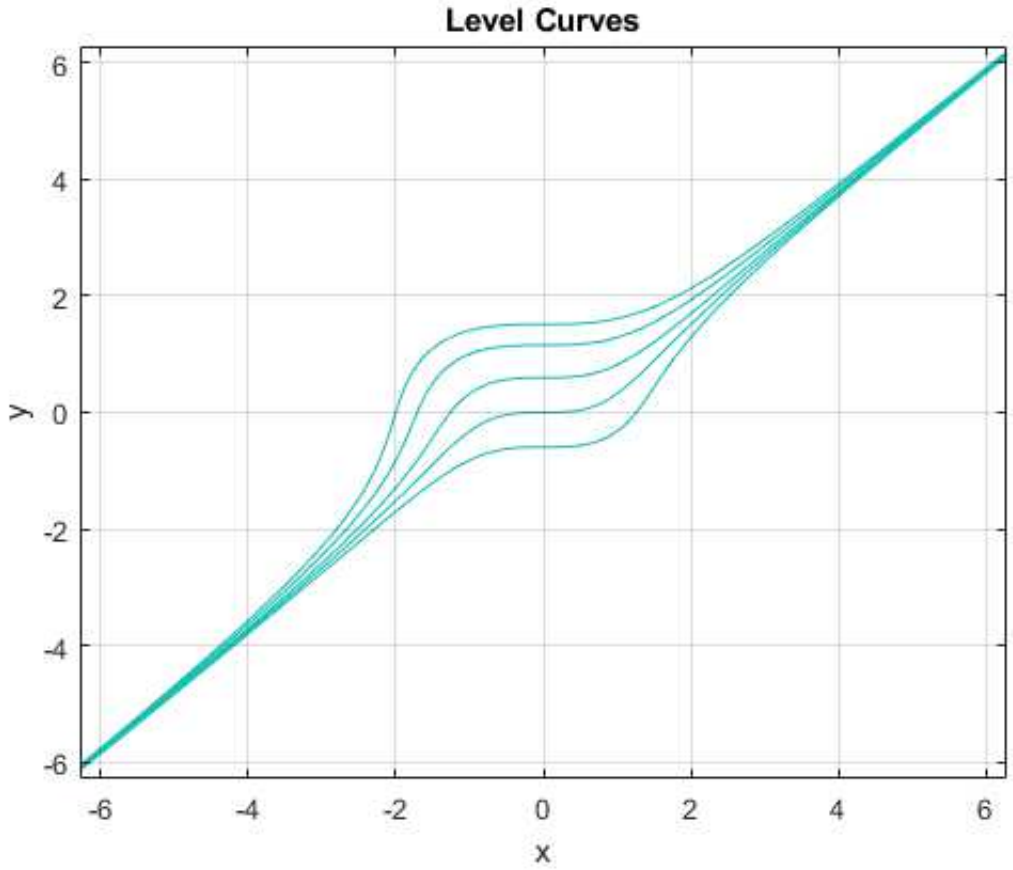



```
%Problem 13:
```

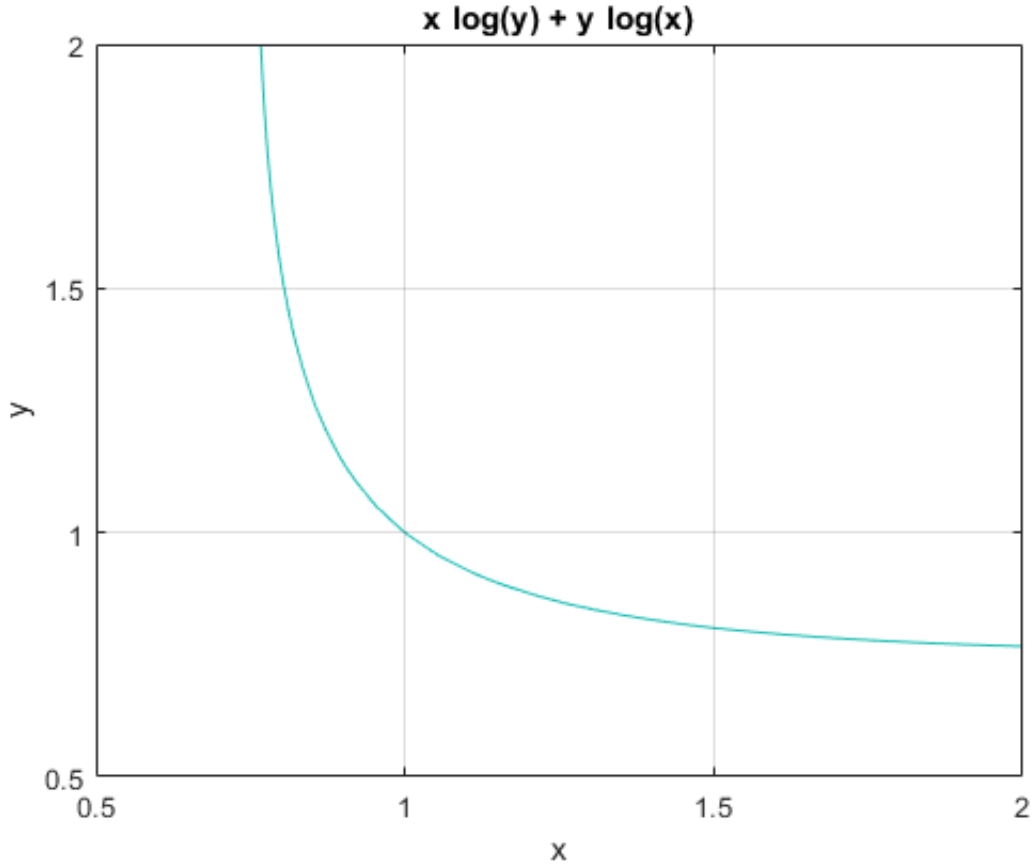
```
%Part a:
syms x y;
ezplot(3*y+y^3-x^3-5)
hold off
grid;
```




```
%Part b:
syms x y;
ezplot(3*y+y^3-x^3+2)
hold on
ezplot(3*y+y^3-x^3)
ezplot(3*y+y^3-x^3-2)
ezplot(3*y+y^3-x^3-5)
ezplot(3*y+y^3-x^3-8)
hold off
title('Level Curves')
grid;
```




```
%Part c:
syms x y z;
z=(1*log(1)+1*log(1));
ezplot(y*log(x)+x*log(y)-z)
grid;
xlim([.5 2]);
ylim([0.5 2]);
```

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