# Eric Wan - [ezw23@drexel.edu](mailto:ezw23@drexel.edu) - Lab 1
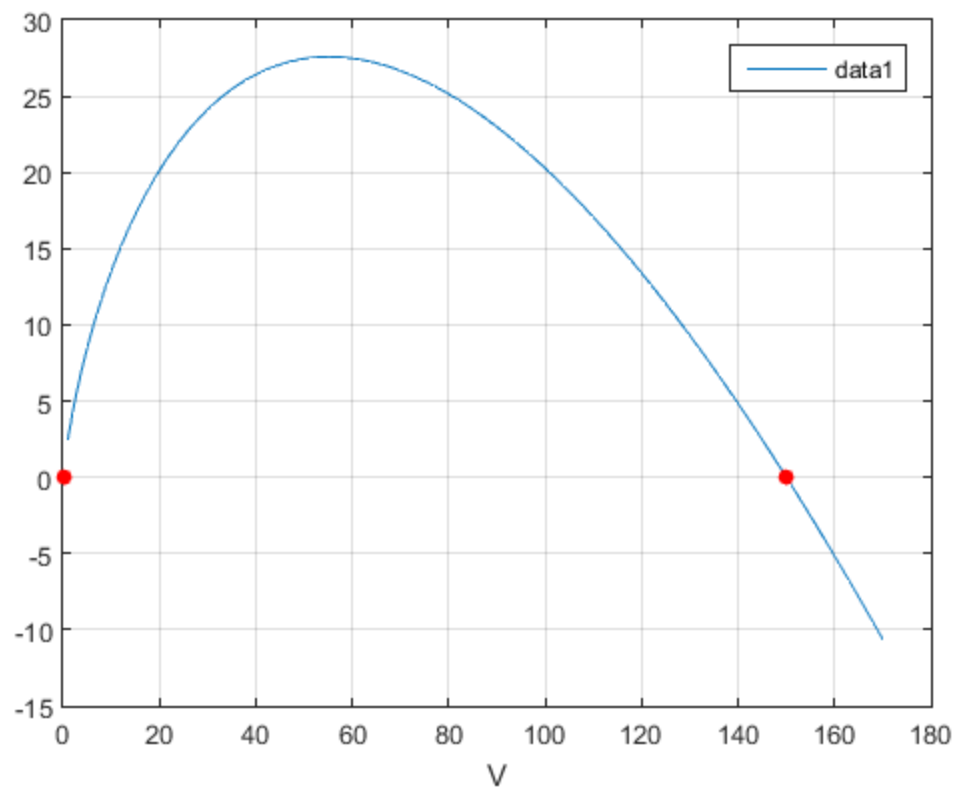
## Table of Contents

# Question 1

```
B = 0.5;
k = 150;
V = 0:1:170;
n = numel(V);
pts = zeros(1,n);
for i = 1:n
   dV = B*V(i)*log(k/V(i));
   pts(i) = dV;
end
figure
plot(V, pts)
hold on
grid on
legend show
xlabel('V')
```
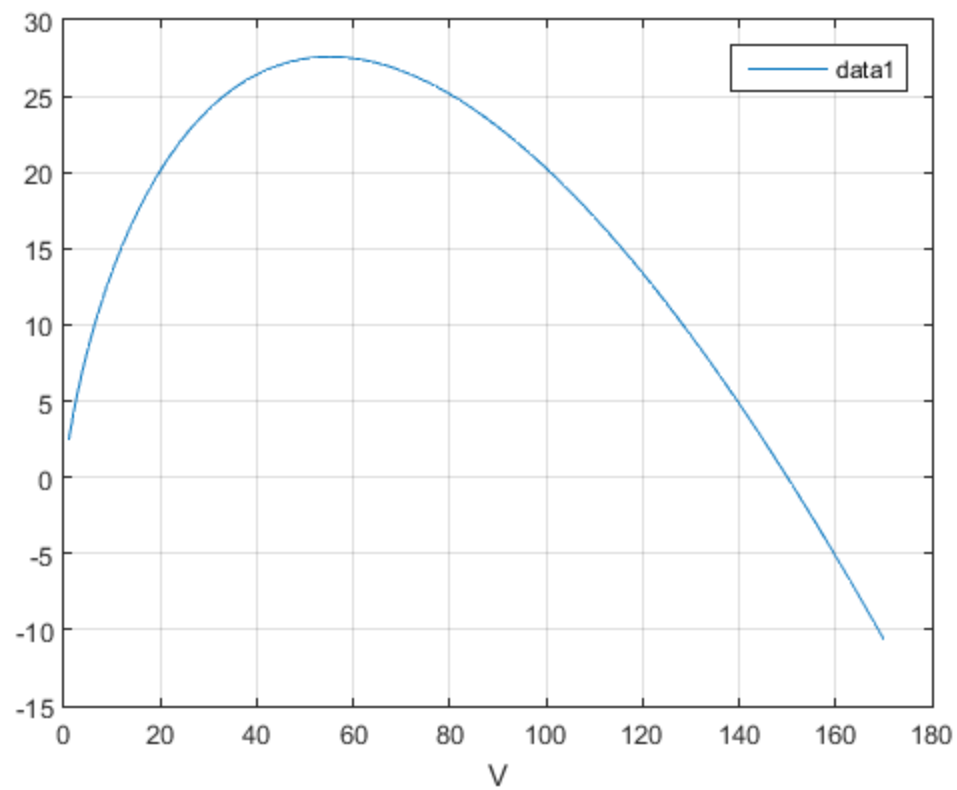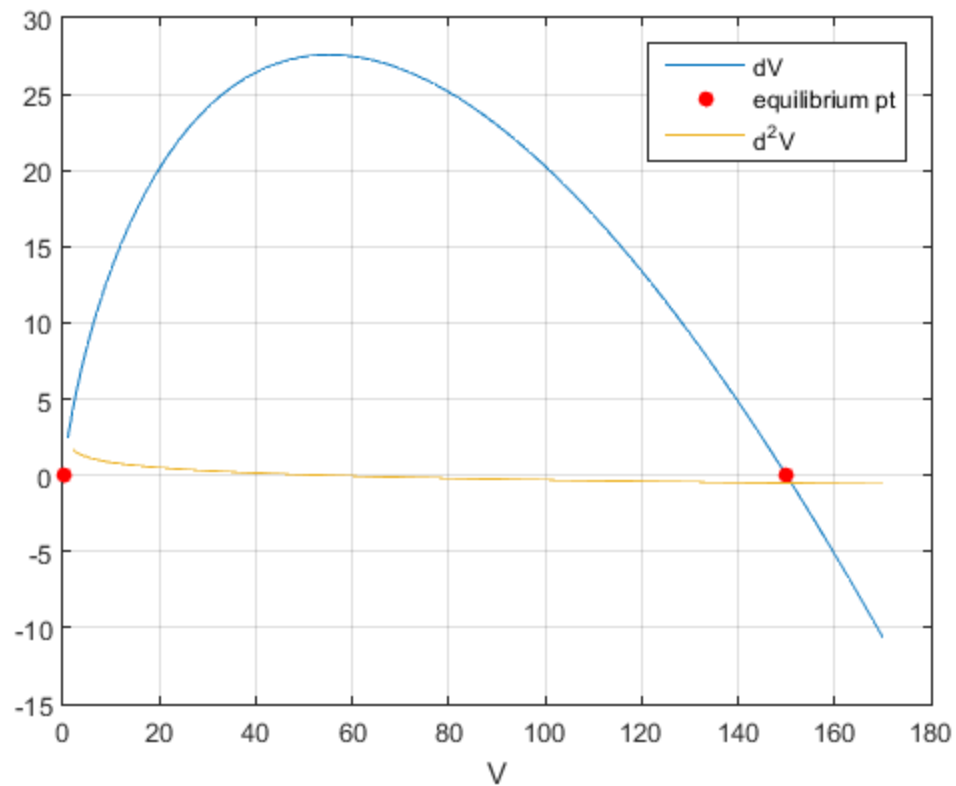
# Question 2

```
eq = [0 V(151); 0 pts(151)];
scatter(eq(1,:), eq(:,1),'r','filled')
```

# Question 3

```
d2V = gradient(pts);
plot(V, d2V)
legend('dV', 'equilibrium pt','d^2V')
```

# Question 4

```
%{
Regions of Attraction
@ V = 0, [0], unstable
@ V = 150, (0,infinity) stable
%}
```

# Question 5

```
%{
No as there is no indication of time past
%}
```

# Question 6

# Question 7

```
%{
x' = 0.5*x*log(150/x)
independant var = t
min/max of t = -30/30
min/max of x = 0/170
```

```
%}
```

# Question 8

```
%{
The results show that the direction fields go to 150 and away from 0
%}
```

# Question 9

```
%{
The results show that it would take 15 seconds to have V = 140
%}
```

# Question 10

```
%{
The results show that it would take 20 seconds to have V = 140.
This takes longer than in question 9.
%}
```

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