

```
%% Homework 3 Brandon Lim
```

```
%% Problem 1 Part C
```

```
clear,clc,close all
```

```
y_tilda = linspace(0,1,10);
P_tilda = [15, 10, 5, 0, -5, -10, -15];
```

```
figure
```

```
hold on
```

```
for i = 1:length(P_tilda)
```

```
    u_tilda = (-P_tilda(i) .* (1./2) .* y_tilda.^2) + (1+P_tilda(i) .* (1./2)) .* y_tilda;
```

```
    plot(u_tilda,y_tilda)
```

```
end
```

```
legend({'$\tilde{P}=15$', '$\tilde{P}=10$', '$\tilde{P}=5$', '$\tilde{P}=0$', '$\tilde{P}=-5$', '$\tilde{P}=-10$', '$\tilde{P}=-15$'}, "Interpreter", "latex", "Location", "eastoutside")
```

```
ylabel("$\frac{y}{b}$", "Interpreter", "latex"); xlabel("$\frac{u}{U}$", "Interpreter", "latex"); title("Problem 1 Part C")
```

```
%% Problem 3 Part D
```

```
clear,clc,close all
```

```
y_tilda = linspace(0,1,10);
alpha = 60; %deg
```

```
u_tilda = sind(alpha).*(y_tilda - (1./2) .* (y_tilda.^2));
```

```
plot(u_tilda,y_tilda)
```

```
ylabel("$\frac{y}{h}$", "Interpreter", "latex"); xlabel("$\frac{\mu u}{\rho gh^2}$", "Interpreter", "latex"); title("Problem 3 Part d")
```

```
%% Problem 4 Part C
```

```
clear,clc,close all
```

```
y_tilda = linspace(0,1,10);
phsi = linspace(0,1,10);
```

```
figure
```

```
hold on
```

```
for i = 1:length(phsi)
```

```
    T_tilda = phsi(i) .* (-12.*y_tilda.^4 + 24.*y_tilda.^3 - 18.*y_tilda.^2 + 6.*y_tilda) + y_tilda;
```

```
    plot(T_tilda,y_tilda)
```

```
end
```

```
legend({'$\tilde{\Psi}=0.00$', '$\tilde{\Psi}=0.11$', '$\tilde{\Psi}=0.22$', '$\tilde{\Psi}=0.33$', '$\tilde{\Psi}=0.44$', '$\tilde{\Psi}=0.55$', '$\tilde{\Psi}=0.66$', '$\tilde{\Psi}=0.77$', '$\tilde{\Psi}=0.99$', '$\tilde{\Psi}=1.00$'}, "Interpreter", "latex", "Location", "eastoutside")
```

```
ylabel("$\frac{y}{h}$", "Interpreter", "latex"); xlabel("$\frac{T-T_o}{\Delta T}$", "Interpreter", "latex"); title("Problem 4 Part C")
```

