```
figure(1);

y_coords = [5;5;5;5;5;5;5;5;5;5;5;5;5;5;5;5;5;5;5;5];

subplot(4,2,1); plot(x_coords,y_coords);title('Potential with vanishing rate of change'); syms y(x);
syms x; y = @(x) x;

subplot(4,2,4); fun_sol_1 = @(x) 5 - 5 * exp(-5 * x) - x./sqrt(5); fun_sol_2 = @(x) 10 - 10 *
exp(-10 * x) - x./sqrt(10); fplot(fun_sol_1,[0,20]); hold on; fplot(fun_sol_2 , [0,20]); ylim([0,11]) ;
title('Exact solution for Constant class potentials'); legend('c=5', 'c=10');

subplot(4,2,2); func_sol_3 = @(x) x * (x-10)./10 ;func_sol_45 = @(x) x * (x-30)./30 ;
fplot(func_sol_3 , [0,20]) ; hold on; fplot(func_sol_45 , [0,20]); title('Exact solution for potentials
with vanishing derivative'); legend('c=10', 'c=30');

subplot(4,2,3); plot([1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;17;18;19;20],x_coords);
title('Potential with constant rate of change');

subplot(4,2,5); func_2 = @(x) x^8; fplot(func_2,[0,20]); title('Potential approaching infinity');

subplot(4,2,6); points = [ ];

result_1 = 9^(1./9) * gamma(1./9)./9;

I = 1; coords_J = linspace(1,4,61);

for J = 1 : 0.05: 4

        func_value_1 = (result_1) - ( igamma(1./9,J./9)./9^(8./9) ) + ( 9^(1./9) .* igamma(1./9,J./9)
        .* func_third_term(J) )  - (  1./(9^(8./9) .* igamma(1./9,J./9)  .*  func_last_integral(J)));
        points(I) = func_value_1;
        I = I+1;

end


plot(coords_J,points); title('Numerical approximations of exit times');
```

```
            \hline
        $\tau_{\text{ } \mathrm{Poly}}$  & \multicolumn{1}{m{14cm}|}{ \Large $  \Delta_{\tau} - \int_0^{x_2} \{ \int_{u_2}^{x_2} \{ \prod_{i=2}^{20} 2 \text{ }  \mathrm{exp}\big(- \frac{v_2^i}{i} \big) \} \mathrm{d} v_2 + 1 \}   \prod_{i=2}^{20} \mathrm{exp}\big(- \frac{u_2^i}{i}  \big) \mathrm{d} u_2  $   }      \\
        \hline
                    \hline
```

```
func_value_2 = (result_1) - ( igamma(1./9,(1.2)./9)./9^(8./9) ) + ( 9^(1./9) .* igamma(1./9,(1.2)./9) .* func_third_term(1.2) )  - (  1./(9^(8./9) .* igamma(1./9,(1.2)./9)  .*  func_last_integral(1.2)));

func_value_3 = (result_1) - ( igamma(1./9,(1.3)./9)./9^(8./9) ) + ( 9^(1./9) .* igamma(1./9,(1.3)./9) .* func_third_term(1.3) )  - (  1./(9^(8./9) .* igamma(1./9,(1.3)./9)  .*  func_last_integral(1.3)));

func_value_4 = (result_1) - ( igamma(1./9,(1.4)./9)./9^(8./9) ) + ( 9^(1./9) .* igamma(1./9,(1.4)./9) .* func_third_term(1.4) )  - (  1./(9^(8./9) .* igamma(1./9,(1.4)./9)  .*  func_last_integral(1.4)));

func_value_5 = (result_1) - ( igamma(1./9,(2)./9)./9^(8./9) ) + ( 9^(1./9) .* igamma(1./9,(2)./9)   .* func_third_term(2) )  - (  1./(9^(8./9) .* igamma(1./9,(2)./9)  .*  func_last_integral(2)));
```