**Summary:**

108 variations. Log laws. Transformational graphing

**Question:**

1. Simplify the following expression

<EFOFEX>
id:fxe{fbd8ece3-442c-41ff-836c-d0c6665268cd}
FXGP:DP-nXxdJH6
FXData:

</EFOFEX>

Write your answer in the form *a* ln *bx* where *a* and *b* are real numbers.

1. The graph of the function <EFOFEX>
   id:fxe{3c95d8ee-3010-4c8a-9cc9-7056c1ffeb19}
   FXGP:DP-nXxdJH6
   FXData:

   </EFOFEX> is shown below.

<EFOFEX>
id:fxd{05ac01cb-42a1-4d22-8e5b-2e5045185ef5}
FXGP:DP-nXxdJH6
FXData:

</EFOFEX>

On the axes above, sketch the graph of the function <EFOFEX>
id:fxe{a0421056-7dc9-47ee-ad67-06c29fb105bd}
FXGP:DP-nXxdJH6
FXData:

</EFOFEX>

1. Describe the relationship between the graphs of the functions <EFOFEX>
   id:fxe{79a3e10d-8cb3-4943-83fc-a7c6d6773587}
   FXGP:DP-nXxdJH6
   FXData:

   </EFOFEX> and <EFOFEX>
   id:fxe{1fd46824-75a2-4671-ad5c-015c3c7e8e48}
   FXGP:DP-nXxdJH6
   FXData:

   </EFOFEX>

**Solution:**

1. <EFOFEX>
   id:fxe{a7b9aaf2-b5b1-4f34-88f2-add8ba1ed6d7}
   FXGP:DP-nXxdJH6
   FXData:

   </EFOFEX>

<EFOFEX>
id:fxd{bcb4635e-3ace-4c60-b507-97d05bd222fa}
FXGP:DP-nXxdJH6
FXData:

</EFOFEX>

1. <EFOFEX>
   id:fxe{665f62ab-f416-48d9-ab17-e0678138e528}
   FXGP:DP-nXxdJH6
   FXData:

   </EFOFEX>