

This is the formula for f:

$$f(x) = x^3 + 2x^2 + 3x + 4$$

This is the formula for the derivative of f:

$$g(x) = 3x^2 + 4x + 3$$

A write_derived_formula_to_tex_file.sh

```
maxima -b write_derived_formula_to_tex_file.txt
pdflatex write_derived_formula_to_tex_file_output.tex
```

B write_derived_formula_to_tex_file.txt

```
/* Maxima batch file */

/* Load libraries */
load("stringproc")$

/* Output filename */
filename:"write_derived_formula_to_tex_file_output.tex"$

/* Do the calculations */
F(x):= f(x) = (1*x^3) + (2*x^2) + (3*x) + 4;
G(x):= g(x) = '(diff(rhs(F(x)),x));

/* Write results to TeX file */
stream: openw(filename)$
/* A newline is denoted by ~% */
printf(stream, "\\documentclass{article}~%")$
printf(stream, "~%")$
printf(stream, "\\usepackage{listings}~%")$
printf(stream, "~%")$
printf(stream, "\\begin{document}~%")$
printf(stream, "~%")$
printf(stream, "This is the formula for f:~%")$
printf(stream, "~%")$
/* tex(my_formula, false) writes the TeX formula to output
   */
printf(stream, tex(F(x), false))$
printf(stream, "~%")$
```

```

printf(stream,"This is the formula for the derivative of
f:~%")$
printf(stream,"~%")$
printf(stream,tex(G(x),false))$
printf(stream,"~%")$
printf(stream,"\\appendix~%")$
printf(stream,"~%")$
printf(stream,"\\section{write\\_derived\\_formula\\_to\\_
tex\\_file.sh}~%")$
printf(stream,"~%")$
printf(stream,"\\lstinputlisting[language=C++,
showstringspaces=false, breaklines=true, frame=single]{
write_derived_formula_to_tex_file.sh}~%")$
printf(stream,"~%")$
printf(stream,"\\section{write\\_derived\\_formula\\_to\\_
tex\\_file.txt}~%")$
printf(stream,"~%")$
printf(stream,"\\lstinputlisting[language=C++,
showstringspaces=false, breaklines=true, frame=single]{
write_derived_formula_to_tex_file.txt}~%")$
printf(stream,"~%")$
printf(stream,"\\end{document}~%")$
close(stream)$

```