Please clearly show all your work on the following problems.

1) Find each of the following limits.

\[
\lim_{x \to 2} \frac{x^2 + 4}{x - 5}
\]

\[
\lim_{x \to 2} \frac{x^2 - 4}{x - 2}
\]

2) Find each of the following derivatives.

\[
\frac{d}{dx}(x^6 + 4x^3 + 7)
\]

\[
\frac{d}{dx}e^{\sin(x^2 + 2x)}
\]

3) Find each of the following integrals.

\[
\int_1^2 4x^3 + 7 \, dx
\]

\[
\int 2x(x^2 + 1)^5 \, dx
\]