1. (2 points) Find the domain of the function $f(x) = \sqrt{50 - 2x} + \ln(x - 8)$.

$50 - 2x \geq 0$ and $x - 8 > 0$

$50 \geq 2x$ $\quad x > 8$

$25 \geq x$

$8 < x \leq 25$

or $(8, 25]$

2. (2 points) Suppose that $f(x) = \dfrac{1}{x^2 - 4}$ and $g(x) = \dfrac{1}{x} + 5$.

(a) Find a simplified formula for $(g \circ f)(x)$.

$(g \circ f)(x) = g(f(x))$

$= g\left(\frac{1}{x^2-4}\right)$ $\quad x \neq 2, x \neq -2$

$= \frac{1}{1/(x^2-4)} + 5$

$= x^2 - 4 + 5$

$= x^2 + 1$

(b) Find the domain of $(g \circ f)(x)$.

all real numbers except ± 2

or

$(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

3. (3 points) Given that $f(x)$ is an even function and that $g(x) = (f(x) + 5)^3$, is $g(x)$ an odd function, an even function or neither? Give a clear justification for your answer.

$g(-x) = (f(-x)+5)^3$

$= (f(x)+5)^3$ since f is even

$= g(x)$

g is an even function

4. (3 points) Carefully sketch the graph of $y = 5 + 2e^{-x}$. If there are any horizontal or vertical intercepts or asymptotes, then their locations should be accurately shown on your graph.