Name: _____

Decomposition of Functions

1) If $f(x) = 9^{2x}$ and $h(x) = 9^{(2x^2 - 14)}$, identify $g(x)$ such that $h(x) = (f \circ g)(x)$.

i) $x^2 + 7$ ii) $x^2 - 7$ iii) $2x^2 - 10$ iv) $2x^2 - 12$

2) If $g(x) = 8x - 6$ and $h(x) = \frac{4x + 2}{3}$, find $f(x)$ such that $g(x) = (h \circ f)(x)$.

i) $5x - 7$ ii) $3x - 2$ iii) $6x - 5$ iv) $9x - 10$

3) If $f(x) = x + 3$ and $g(x)$)(x).

i) $\sqrt{x + 9}$ iv) $\sqrt{x^2 + 7x + 9}$

4) If $h(x) = 4x^6 - 12x^3 +$ $f)(x)$.

i) $f(x) = 4x^2$; $g(x) =$ $(x) = x^2 + 5$

iii) $f(x) = 2x^6$; $g(x) =$ $c) = 2x^3 - 3$

5) If $f(x) = 14x + 3$, find h

i) $g(x) = 14 \log_e x +$; $h(x) = e^{7x}$

iii) $g(x) = 9 \log_e x + 3$; $h(x) = e^{3x}$ iv) $g(x) = 7 \log_e x + 3$; $h(x) = e^{2x}$

6) If $g(x) = -79$, identify $f(x)$ and $h(x)$ such that $g(x) = (f \circ h)(x)$.

i) $h(x) = 6$; $f(x) = 2x^2 - 4x - 1$ ii) $f(x) = x^2$; $h(x) = -7$

iii) $f(x) = -x^2 - 15$; $h(x) = -8$ iv) $h(x) = 4$; $f(x) = -3x^2 - 2$