

## Decomposition of Functions

1) If  $g(x) = 3x^2 - 5$  and  $f(x) = 9x^4 - 36x^2 + 35$ , find  $h(x)$  such that  $f(x) = (h \circ g)(x)$ .

i)  $2x^2 + 5x$

ii)  $5x^4 - 3x$

iii)  $3x^2 + 2$

iv)  $x^2 - 2x$

2) If  $h(x) = 63$  and  $g(x) = 2x^2 - x + 8$ , identify  $f(x)$  such that  $h(x) = (g \circ f)(x)$ .

i) 7

ii) -5

iii) 8

iv) -6

3) If  $g(x) = 48x - 8$  and  $h(x) = 4 \log_{10} x^3 - 6$ , find  $f(x)$  such that  $h(x) = (f \circ g)(x)$ .

i)  $4 \log_{10} x^3 - 6$

iv)  $5 \log_{10} x^3 - 16$

4) If  $f(x) = 2x^2 + 4$ , identify  $g(x)$  and  $h(x)$  such that  $f(x) = (g \circ h)(x)$ .

i)  $g(x) = \frac{2x+5}{3}$  ;  $h(x) = x^2 + 2$

iii)  $h(x) = \frac{x-9}{4}$  ;  $g(x) = 4x^2 + 11$

5) If  $g(x) = 8^{(x-2)^2}$ , identify  $f(x)$  and  $h(x)$  such that  $g(x) = (f \circ h)(x)$ .

i)  $f(x) = -x^2 + 4x - 4$  ;  $h(x) = 2^{-3x}$

iii)  $f(x) = x^2 + 4x - 4$  ;  $h(x) = 8^{-x}$

iv)  $f(x) = x^2 + 4x + 4$  ;  $h(x) = 8^x$

6) If  $h(x) = x + 6$ , find  $f(x)$  and  $g(x)$  such that  $h(x) = (f \circ g)(x)$ .

i)  $f(x) = x + 8$  ;  $g(x) = \sqrt[3]{x^3 + 6}$

ii)  $f(x) = x^3 + 13$  ;  $g(x) = \sqrt[3]{x - 7}$

iii)  $f(x) = \sqrt[3]{x - 7}$  ;  $g(x) = x^3 + 13$

iv)  $f(x) = \sqrt[3]{x^3 + 6}$  ;  $g(x) = x + 8$

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