

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

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

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

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

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 $f(x)$ such that $f(g(x)) = 2^{-3x}$.

i) $f(x) = -x^2 + 4x - 4$

iv) $f(x) = 2^{-3x}$

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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