

Decomposition of Functions

1) If $h(x) = 3^{(x+4)}$ and $g(x) = 5x + 20$, identify $f(x)$ such that $g(x) = (f \circ h)(x)$.

i) $4 \log_3 x$

ii) $5 \log_2 x$

iii) $5 \log_3 x$

iv) $4 \log_3 2x$

2) If $f(x) = x^2 + 5$ and $g(x) = x^2 + 6$, identify $h(x)$ such that $f(x) = (h \circ g)(x)$.

i) $\sqrt{x^2 - 2x + 1}$

ii) $\sqrt{x^2 - 2x - 1}$

iii) $\sqrt{2x^2 + 11}$

iv) $\sqrt{2x^2 + 1}$

3) If $h(x) = e^{(6x-20)}$ and $f(x) = 3x - 13$, identify $g(x)$ such that $h(x) = (f \circ g)(x)$.

i) $3x - 13$

iv) $3x - 27$

4) If $g(x) = 97$, find $f(x)$ and $h(x)$ such that $f(g(x)) = h(x)$.

i) $f(x) = 2x^2 + 5$; $h(x) = 2x^2 - 9$

iii) $f(x) = 9$; $h(x) = 4$

5) If $h(x) = 10x - 4$, identify $f(x)$ and $g(x)$ such that $h(x) = (f \circ g)(x)$.

i) $f(x) = \frac{5x-1}{4}$; $g(x) = \frac{5x-1}{4}$

iii) $f(x) = \frac{5x+1}{4}$; $g(x) = 5x - 4$

iv) $f(x) = 5x - 4$; $g(x) = \frac{5x+1}{4}$

6) If $f(x) = x^6 - 6x^5 + 9x^4 + 8$, identify $g(x)$ and $h(x)$ such that $f(x) = (g \circ h)(x)$.

i) $g(x) = x^2 + 8$; $h(x) = x^3 - 3x^2$

ii) $g(x) = 4x^2 - 1$; $h(x) = x^3 - 5x^2$

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

iv) $g(x) = 2x^3 - x^2$; $h(x) = x^2 - x$

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