Calculus Preview :: Function Decomposition and Difference Quotient

1 - 5: For each of the following functions $h(x)$, determine $f(x)$ and $g(x)$ such that $h(x) = (fog)(x)$.

1. $h(x) = \sqrt{x^2 - 2}$

$f(x) =$_____

Check: $(fog)(x) =$

$g(x) =$_____

2. $h(x) = (5x + 7)^2$

$f(x) =$_____

Check: $(fog)(x) =$

$g(x) =$_____

3. $h(x) = \frac{1}{4x^3+1}$

$f(x) =$_____

Check: $(fog)(x) =$

$g(x) =$_____

4. $h(x) = (x - 5)^{\frac{3}{2}}$

$f(x) =$_____

Check: $(fog)(x) =$

$g(x) =$_____

5. $h(x) = 4^{x^2-9}$

$f(x) =$_____

Check: $(fog)(x) =$

$g(x) =$_____

6 - 7: Let $f(x) = 5x + 3$ and $g(x) = x + h$

6. Find $f(g(x))$

$f(g(x)) =$ _____

7. Find $\frac{f(x+h)-f(x)}{h}$

$\frac{f(x+h)-f(x)}{h} =$ _____

8 - 10: Let $f(x) = x^2 + 3x + 1$

8. Find $f(7)$

$f(7) =$ _____

9. Find $f(x + h)$

$f(x + h) =$ _____

10. Find $\frac{f(x+h)-f(x)}{h}$

$\frac{f(x+h)-f(x)}{h} =$ _____