

Algebra II --- Operations on Functions

SPI 3103.3.6 Combine functions (such as polynomial, rational, radical and absolute value expressions) by addition, subtraction, multiplication, division, or by composition and evaluate at specified values of their variables.

Perform each of the operations indicated below. Place the letter beside each problem answer blanks below that corresponds to the problem number to find out what the quote is and who said it. Some problem numbers will appear more than once.

Find $(f + g)(x)$ for each of the following functions.

1. $f(x) = 5x - 4$
 $g(x) = 4x - 11$
 $9x - 15$

2. $f(x) = 4x^2 - 2x + 3$
 $g(x) = -11x^2 + 8x - 1$
 $-7x^2 + 6x + 2$

3. $f(x) = 2x^3 - 5x^2 + x - 3$
 $g(x) = 8x^2 + 5$
 $2x^3 + 3x^2 + x + 2$

Find $(f - g)(x)$ for each of the following functions.

4. $f(x) = 8x - 20$
 $g(x) = -3x + 19$
 $11x - 39$

5. $f(x) = x^2 - 9$
 $g(x) = 7x^2 - 4x + 2$
 $-6x^2 + 4x - 11$

6. $f(x) = 3x^2 + 10x - 4$
 $g(x) = -6x^2 + x - 8$
 $9x^2 + 9x + 4$

Find $(f \cdot g)(x)$ for each of the following functions.

7. $f(x) = x + 3$
 $g(x) = x - 7$
 $x^2 - 4x - 21$

8. $f(x) = 5x^2$
 $g(x) = 4x^2 + 9x - 3$
 $20x^4 + 45x^3 - 15x^2$

9. $f(x) = 6x - 1$
 $g(x) = 2x^2 - 3x + 5$
 $12x^3 - 20x^2 + 33x - 5$

Find $\left(\frac{f}{g}\right)(x)$ for each of the following functions.

10. $f(x) = x + 8$
 $g(x) = x - 2$
 $\frac{x+8}{x-2}$

11. $f(x) = 10x^2 - 12x - 8$
 $g(x) = 2x - 6$
 $\frac{5x^2 - 6x - 4}{x - 3}$

12. $f(x) = x^2 + 8x + 16$
 $g(x) = x + 4$
 $x + 4$

Find $[f \circ g](x)$ for each of the following functions.

13. $f(x) = 3x$
 $g(x) = 2x + 5$
 $6x + 15$

14. $f(x) = x + 6$
 $g(x) = x^2 - 4x + 7$
 $x^2 - 4x + 13$

15. $f(x) = 4x$
 $g(x) = x^3 + 3x^2 + 2x - 8$
 $4x^3 + 12x^2 + 8x - 32$

Find $[g \circ f](x)$ for each of the following functions.

16. $f(x) = 3x$
 $g(x) = 2x + 5$
 $6x + 5$

17. $f(x) = x + 6$
 $g(x) = x^2 - 4x + 7$
 $x^2 + 8x + 19$

18. $f(x) = 4x$
 $g(x) = x^3 + 3x^2 + 2x - 8$
 $64x^3 + 48x^2 + 8x - 8$