Linear Equations and Composition of Functions

Linear Equations

Write the equation in Standard Form ($Ax + By = C$) for the…

1. line containing point $(4,-7)$ and having slope $\frac{5}{2}$.
2. line containing point $(-13,5)$ and parallel to $4x + 2y = -11$.
3. line containing point $(0,-2)$ and perpendicular to $2x + 5y = -1$.
4. perpendicular bisector of the segment between $(4,-3)$ and $(2,11)$.
5. line containing point $(2,9)$ and having slope 0.
6. perpendicular bisector of the segment between $(-5,3)$ and $(12,3)$.

Composition of Functions

Given $f(x) = 4x - 1$ and $g(x) = x + 6$, find the following compositions.

7. $g(f(x))$
8. $f(g(x))$
9. $f(f(x))$

Given $f(x) = x^2 - 4$, $g(x) = x - 1$, and $h(x) = 3x + 1$, find the following compositions.

10. $g(h(x))$
11. $f(g(x))$
12. $f(g(h(x)))$
13. $g(h(f(x)))$

Decompose the following into two or more functions, as specified, and show the order of composition that produces the given function.

14. $h(x) = \sqrt{x^2 + 6}$, two functions
15. $h(x) = \cos(x^2 - x)$, two functions
16. $h(x) = \tan^3(x)$, two functions
17. $h(x) = \sqrt[3]{(x^3 + x^2)^2}$, three functions
18. $h(x) = (x + 7)^3 - 5(x + 7)$, two functions
19. $h(x) = \sqrt{x + 2} - \frac{5}{\sqrt{x + 2}}$, two functions
20. $h(x) = \sin^3|\cos(x)|$, four functions