
Use the following functions:

$$f(x) = 3x + 5$$

$$g(x) = x^2 - 1$$

$$h(x) = -\frac{1}{2}x - 2$$

$$k(x) = 3x$$

Find the following:

1. $f(h(2))$

2. $f\left(k\left(\frac{1}{2}\right)\right)$

3. $g(f(4))$

4. $h(f(1))$

5. $(h \circ g)(-4)$

6. $(k \circ f)(-5)$

7. $(f \circ f)(3)$

8. $(g \circ g)(-2)$

9. $f(h(k(2)))$

10. $h(f(g(-5)))$

11. $f(g(x))$

12. $f(f(x))$

13. $f(h(x))$

14. $g(k(x))$

15. $(h \circ k)(x)$

16. $(k \circ g)(x)$

17. $(g \circ f)(x)$

18. $(h \circ g)(x)$

Answers:

1. -4

2. $19/2$

3. 288

4. -6

5. $-19/2$

6. -30

7. 47

8. 8

9. -10

10. $-81/2$

11. $3x^2 + 2$

12. $9x + 20$

13. $-\frac{3}{2}x - 1$

14. $-9x^2 - 1$

15. $-\frac{3}{2}x - 2$

16. $3x^2 - 3$

17. $9x^2 + 30x + 24$

18. $-\frac{1}{2}x^2 - \frac{3}{2}$