

1.6 Combining & Composition of Functions

Perform the indicated operation (see where it says "Find"). Find the domain using interval notation (no range because this is not efficient in Precalculus).

1) $f(x) = x^2 - 5x$
 $g(x) = 2x + 3$
Find $f(x) \cdot g(x)$

2) $f(x) = 2x^2 - x$
 $g(x) = -4x + 3$
Find $f(x) - g(x)$

3) $g(x) = x^3 + 2$
 $h(x) = 3x + 4$
Find $\frac{g(x)}{h(x)}$

4) $g(x) = -x^2 - 4x$
 $h(x) = -7x - 23$
Find $\left(\frac{g}{h}\right)(x)$

5) $h(x) = -x + 5$
 $g(x) = \sqrt{2x - 4}$
Find $\frac{h(x)}{g(x)}$

6) $g(x) = \sqrt{8x - 7}$
 $f(x) = \sqrt{-13x + 15}$
Find $(g - f)(x)$

7) $f(x) = \sqrt{x-2}$
 $g(x) = -x - 1$
Find $(f \circ g)(x)$

8) $f(x) = \frac{1}{-4x+1}$
 $g(x) = 2x - 5$
Find $f(g(x))$

9) $h(x) = \sqrt{4x+5}$
 $g(x) = x^2$
Find $g(h(x))$

10) $g(x) = x^2 - 2$
 $h(x) = \sqrt{2x-1}$
Find $(g \circ h)(x)$

11) $g(x) = \sqrt{4x+5}$
 $f(x) = 2x - 3$
Find $g(f(x))$

12) $h(x) = \sqrt{4x+5}$
 $g(x) = -2x + 4$
Find $h(g(x))$

Answers to 1.6 Combining & Composition of Functions

1) $f(x) \cdot g(x) = 2x^3 - 7x^2 - 15x$
 D: $(-\infty, \infty)$

2) $f(x) - g(x) = 2x^2 + 3x - 3$
 D: $(-\infty, \infty)$

3) $\frac{g(x)}{h(x)} = \frac{x^3 + 2}{3x + 4}$
 D: $\left(-\infty, -\frac{4}{3}\right) \cup \left(-\frac{4}{3}, \infty\right)$

4) $\frac{g(x)}{h(x)} = \frac{-x^2 - 4x}{-7x - 23}$

D: $\left(-\infty, -\frac{23}{7}\right) \cup \left(-\frac{23}{7}, \infty\right)$

5) $\frac{h(x)}{g(x)} = \frac{-x + 5}{\sqrt{2x - 4}}$

D: $(2, \infty)$

6) $(g - f)(x) = \sqrt{8x - 7} - \sqrt{-13x + 15}$

D: $\left[\frac{7}{8}, \frac{15}{13}\right]$

7) $(f \circ g)(x) = \sqrt{-x - 3}$

D: $(-\infty, -3]$

8) $f(g(x)) = \frac{1}{-8x + 21}$

D: $\left(-\infty, \frac{21}{8}\right) \cup \left(\frac{21}{8}, \infty\right)$

9) $g(h(x)) = 4x + 5$

D: $\left[-\frac{5}{4}, \infty\right)$

10) $(g \circ h)(x) = 2x - 3$

D: $\left[\frac{1}{2}, \infty\right)$

11) $g(f(x)) = \sqrt{8x - 7}$

D: $\left[\frac{7}{8}, \infty\right)$

12) $h(g(x)) = \sqrt{-8x + 21}$

D: $\left(-\infty, \frac{21}{8}\right]$