

MATH 125: SECTION 2.2 & 2.3 EXERCISES

For #1 – 6, find $f + g$, $f - g$, fg , f/g , and their domains.

$$1. f(x) = \sqrt{1-x}, \quad g(x) = \frac{1}{x-2}$$

$$2. f(x) = \sqrt{10+x}, \quad g(x) = \sqrt{50-x}$$

$$3. f(x) = \sqrt{9-x^2}, \quad g(x) = \sqrt{x^2-1}$$

$$4. f(x) = \frac{2}{x+2}, \quad g(x) = \frac{x}{x+2}$$

$$5. f(x) = \frac{1}{\sqrt{2x-3}}, \quad g(x) = 3x^2 - 8$$

$$6. f(x) = \sqrt[6]{3-x}, \quad g(x) = \sqrt[4]{x-5}$$

For #7 – 12, find $f \circ g$, $g \circ f$, $f \circ f$, $g \circ g$, and their domains.

$$7. f(x) = 3x^2 - 7, \quad g(x) = x + 5$$

$$8. f(x) = \sqrt{x-3}, \quad g(x) = x^2$$

$$9. f(x) = \frac{1}{x-1}, \quad g(x) = \frac{x-1}{x+1}$$

$$10. f(x) = \sqrt[3]{x}, \quad g(x) = 1 - \sqrt{x}$$

$$11. f(x) = \sqrt{x^2-4}, \quad g(x) = \sqrt{2-x}$$

$$12. f(x) = \frac{1}{\sqrt[4]{x}}, \quad g(x) = x^2 - 4x$$

For #13 – 14, find $f \circ g \circ h$ and its domain.

$$13. f(x) = \sqrt{x-2}, \quad g(x) = \sqrt[4]{x-1}, \quad h(x) = \sqrt[3]{x+3}$$

$$14. f(x) = \sqrt{2x}, \quad g(x) = \frac{x}{x-1}, \quad h(x) = \sqrt[5]{x}$$

For #15 – 18, find simple functions that do the job of the complex function.

$$15. H(x) = (x-8)^4. \text{ Find functions } f \text{ and } g \text{ so that } f \circ g = H.$$

$$16. L(x) = \frac{1}{5x-3}. \text{ Find functions } f \text{ and } g \text{ so that } f \circ g = L.$$

$$17. \Phi(x) = \sqrt[3]{\sqrt{x}-1}. \text{ Find functions } f, g \text{ and } h \text{ so that } f \circ g \circ h = \Phi.$$

$$18. W(x) = \frac{9}{(4-\sqrt{x})^2}. \text{ Find functions } f, g \text{ and } h \text{ so that } f \circ g \circ h = W.$$