1. Determine the domain for each function. State the domain using interval notation.

(a) $f(x) = 2x^2 - 3x + 5$

(b) $g(x) = 3x - 9$

(c) $h(x) = x^3 - x$

(d) $j(x) = \frac{1}{x}$

(e) $k(x) = \frac{3x - 9}{x - 3}$

(f) $l(x) = \frac{3x - 9}{2x + 4}$

(g) $m(x) = \sqrt{2x - 5}$

(h) $g(x) = \begin{cases} 2x - 5, & x < 3 \\ x - 2, & x \geq 3 \end{cases}$

(i) $n(x) = \sqrt{2x^2 - 18}$

(j) $p(x) = \sqrt{3x^2 - 2x - 5}$

(k) $q(x) = \frac{2}{5}$

(l) $r(x) = 2\left(3^x\right)$

(m) $s(x) = \sqrt[3]{3x^2 + 12}$

(n) $v(x) = \frac{x^2 - 4x + 3}{x^3 - 5x^2 + 6x}$

(o) $k(x) = \begin{cases} x^2, & x < -1 \\ x^3, & x \geq -1 \end{cases}$

(p) $k(x) = \frac{5}{\sqrt{x}}$

(q) $z(x) = 7$

2. Determine the zeros, if any, of the given functions.

(a) $f(x) = 2x^2 - 3x + 5$

(b) $h(x) = x^3 - x$

(c) $j(x) = \frac{1}{x}$

(d) $k(x) = \frac{3x - 9}{x - 3}$

(e) $l(x) = \frac{3x - 9}{2x + 4}$

(f) $m(x) = \sqrt{2x - 5}$

(g) $n(x) = \sqrt{2x^2 - 18}$

(h) $p(x) = \sqrt{3x^2 - 2x - 5}$

(i) $q(x) = \frac{2}{5}$

(j) $r(x) = 2\left(3^x\right)$

(k) $g(x) = 3x - 9$

(l) $s(x) = \sqrt[3]{3x^2 + 12}$

3. Given the functions $f(x) = \sqrt{x}$, $s(x) = \left(3x^2 + 12\right)^2$, $g(x) = 2x^2 - 3x + 5$, $k(x) = \frac{1}{x}$, and $h(x) = \frac{x - 2}{3 - x}$, find the following. Simplify your answer completely.

(a) $(f + g)(x)$

(b) $(g - f)(x)$

(c) $(f \cdot g)(x)$

(d) $(f / g)(x)$

(e) $(f \circ g)(x)$

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

(g) $(s + g)(x)$

(h) $(s \cdot g)(x)$

(i) $(f \circ k)(x)$

(j) $(k \circ f)(x)$

(k) $(f - k)(x)$

(l) $(f + k)(x)$

(m) $(f / k)(x)$

(n) $(f \cdot k)(x)$

(o) $(k \circ h)(x)$

(p) $(h \circ k)(x)$

(q) $(h + k)(x)$

(r) $(h - k)(x)$

(s) $(h \cdot k)(x)$

(t) $(h / k)(x)$

(u) $(s \circ k)(x)$

(v) $(k \circ s)(x)$

(w) $(s + k)(x)$

(x) $(s - k)(x)$

(y) $(s \cdot k)(x)$

(z) $(s / k)(x)$

(aa) $(f \circ f)(x)$

4. Determine if the function is even or odd.

(a) $f(x) = x^2 - 4$

(b) $g(x) = 3x^2 - 3x + 7$

(c) $l(x) = x^3$

(d) $h(x) = x^3 - 4x$

(e) $j(x) = x^2 - x^3$

(f) $k(x) = \frac{1}{x}$

(g) $l(x) = |x|$

(h) $m(x) = \frac{3}{2x - 9}$

(i) $k(x) = 4x^2 - 5x^4$

(j) $p(x) = \sqrt{x}$