1. Determine if the parabola opens upward or downward.

(a) $f(x) = 2x^2 - 18$

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

(c) $h(x) = x^2 - 5x + 6$

(d) $j(x) = (2x + 5)(3 - x)$

(e) $k(x) = 7 - 6x - 2x^2$

(f) $l(x) = 5x^2 - 80$

(g) $m(x) = 3x^2 + 7x - 6$

(h) $n(x) = x^2 + 5x - 36$

(i) $p(x) = 4x^2 - 17x - 15$

(j) $q(x) = x^2 - 1$

(k) $r(x) = 8 - 2x^2$

2. Write the equation of each quadratic function in standard form.

(a) $f(x) = 2x^2 - 18$

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

(c) $h(x) = x^2 - 5x + 6$

(d) $j(x) = (2x + 5)(3 - x)$

(e) $k(x) = 7 - 6x - 2x^2$

(f) $l(x) = 5x^2 - 80$

(g) $m(x) = 3x^2 + 7x - 6$

(h) $n(x) = x^2 + 5x - 36$

(i) $p(x) = 4x^2 - 17x - 15$

(j) $q(x) = x^2 - 1$

(k) $r(x) = 8 - 2x^2$

3. State the vertex and the axis of symmetry for each quadratic function.

(a) $f(x) = 2x^2 - 18$

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

(c) $h(x) = x^2 - 5x + 6$

(d) $j(x) = (2x + 5)(3 - x)$

(e) $k(x) = 7 - 6x - 2x^2$

(f) $l(x) = 5x^2 - 80$

(g) $m(x) = 3x^2 + 7x - 6$

(h) $n(x) = x^2 + 5x - 36$

(i) $p(x) = 4x^2 - 17x - 15$

(j) $q(x) = x^2 - 1$

(k) $r(x) = 8 - 2x^2$

4. Find the x-intercept(s), if any, and the y-intercept for each quadratic function.

(a) $f(x) = 2x^2 - 18$

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

(c) $h(x) = x^2 - 5x + 6$

(d) $j(x) = (2x + 5)(3 - x)$

(e) $k(x) = 7 - 6x - 2x^2$

(f) $l(x) = 5x^2 - 80$

(g) $m(x) = 3x^2 + 7x - 6$

(h) $n(x) = x^2 + 5x - 36$

(i) $p(x) = 4x^2 - 17x - 15$

(j) $q(x) = x^2 - 1$

(k) $r(x) = 8 - 2x^2$

5. Explain how the graph of each quadratic function is related to the graph of $y = x^2$.

(a) $f(x) = 2x^2 - 18$

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

(c) $h(x) = x^2 - 5x + 6$

(d) $j(x) = (2x + 5)(3 - x)$

(e) $k(x) = 7 - 6x - 2x^2$

(f) $l(x) = 5x^2 - 80$

(g) $m(x) = 3x^2 + 7x - 6$

(h) $n(x) = x^2 + 5x - 36$

(i) $p(x) = 4x^2 - 17x - 15$

(j) $q(x) = x^2 - 1$

(k) $r(x) = 8 - 2x^2$