

# Work Sheet: quadratic functions

1. Find the vertex of each function, then rewrite it in general form, determine the y-intercept and make a qualitative sketch of the graph. If applicable, work out the zeros.

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

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

c)  $f(x) = 3(x - \frac{3}{2})^2 + 3$

d)  $f(x) = -2(x + 1)^2$

e)  $f(x) = -\frac{3}{2}x^2 + 4$

f)  $f(x) = (x + \frac{1}{2})^2 - \frac{3}{4}$

g)  $f(x) = 1/4x^2 - 1$

h)  $f(x) = \frac{1}{2}(x - 3)^2$

2. Rewrite each function in vertex form and sketch the graph.

a)  $f(x) = x^2 + 6x + 9$

b)  $f(x) = x^2 + 6x + 12$

c)  $f(x) = x^2 + 6x - 6$

d)  $f(x) = x^2 - 10x + 34$

e)  $f(x) = x^2 - 5x + 6$

f)  $f(x) = x^2 - \frac{8}{3}x + \frac{21}{9}$

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

h)  $f(x) = 2x^2 - 4x - 5$

i)  $f(x) = -x^2 - 6x + 6$

j)  $f(x) = -\frac{1}{2}x^2 - 4x - 8$

k)  $f(x) = \frac{2}{5}x^2 - 4x + 12$

3. Rewrite each function in factored form and find its zeros, y-intercept and vertex. Sketch the graph qualitatively.

a)  $f(x) = x^2 + 18x + 72$

b)  $f(x) = x^2 + 23x + 132$

c)  $f(x) = x^2 - 3x - 108$

d)  $f(x) = x^2 - 16x - 36$

e)  $f(x) = x^2 - 18x + 81$

f)  $f(x) = x^2 + 9x - 90$

g)  $f(x) = x^2 - 49$

h)  $f(x) = x^2 + 40x + 400$

i)  $f(x) = 3x^2 + 16x + 5$

j)  $f(x) = 2x^2 + 7x + 3$

k)  $f(x) = x^2 + 9x$

l)  $f(x) = x^2 - 40x$

m)  $f(x) = 5x^2 + 10x - 75$

n)  $f(x) = -4x^2 - 4x + 48$

o)  $f(x) = -3x^2 - 3x + 60$