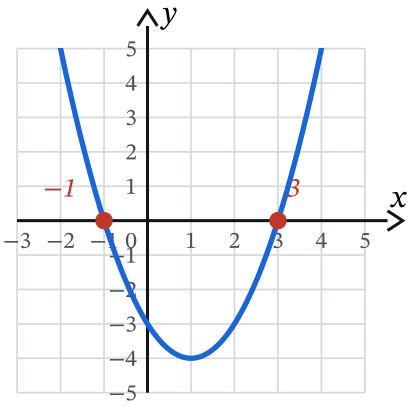
Name _____ Date _____

# Zeros of a Quadratic Function

Example




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

The graph crosses the $x$-axis at $x = -1$ and $x = 3$. These are the **zeros**: $f(x) = 0$.

By calculation: $x^2 - 2x - 3 = 0$, so $(x + 1)(x - 3) = 0$.

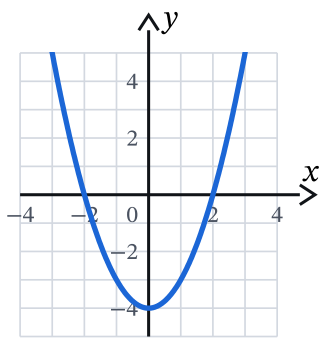
$f(x) = (x + 1)(x - 3)$

**Remember**

A **zero** of a function is a number $x$ for which $f(x) = 0$: there the graph crosses or touches the $x$-axis. If $x_1$ and $x_2$ are the zeros, then $f(x) = a(x - x_1)(x - x_2)$ (**factored form**).

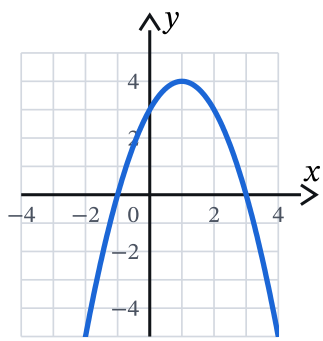
**1** ON YOUR OWN Read the zeros from the graph.

**a)**



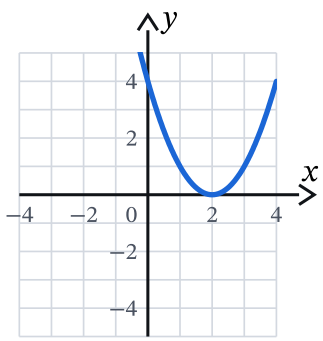

$x_1 =$ ☐ $x_2 =$ ☐

**b)**




$x_1 =$ ☐ $x_2 =$ ☐

**c)**




$x_1 =$ ☐ $x_2 =$ ☐

Names (pair) _____ Date _____

**2** ON YOUR OWN Work out the zeros and write the factored form.

| Function | Zeros | Factored form |
|---|---|---|
| $x^2 - 5x + 6$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |
| $x^2 - 9$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |
| $2x^2 - 8x$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |
| $x^2 + 2x - 15$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |
| $(x-1)^2 - 9$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |
| $-x^2 + x + 6$ | $x_1 =$ ☐ $x_2 =$ ☐ | ☐ |

**3** IN PAIRS **From zeros to the formula.** One student writes the factored form, the other multiplies it out to standard form. Swap roles.

zeros $-1$ and $4$, $a = 1$: $f(x) =$ ☐ $=$ ☐

zeros $0$ and $3$, $a = -2$: $f(x) =$ ☐ $=$ ☐

double zero $2$, $a = 1$: $f(x) =$ ☐ $=$ ☐

★ ON YOUR OWN **Exit card.** Is $x = 5$ a zero of $f(x) = x^2 - 3x - 10$? **yes** / **no** The other zero: ☐