

Algebra 2 - Forms of Quadratic Functions - Worksheet

Common Core A-SSE.B.3a, A-SSE.B.3b, F-IF.C.8a · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice the forms of quadratic functions (Common Core A-SSE.B.3a, A-SSE.B.3b and F-IF.C.8a). The first problems check reading features from each form, the middle problems add completing the square and converting between forms, and the last six are word problems and multi-step tasks that need modeling with quadratics and writing equations from graphs.

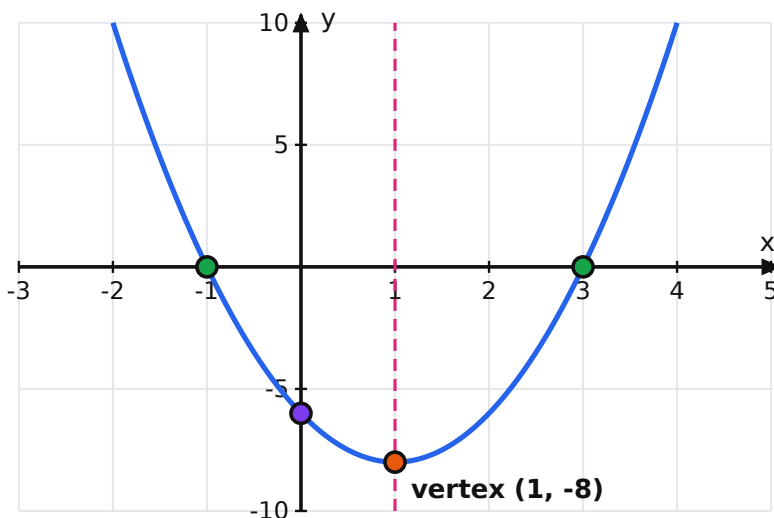
Work in order and show every step. Write each answer in simplest form, and open the answer key only after you have tried the problem yourself.

Algebra 2 · Common Core State Standards: **A-SSE.B.3a, A-SSE.B.3b, F-IF.C.8a**

Exercise 1 - Read the y-intercept

Find the y-intercept of $f(x) = 2x^2 - 5x + 7$.

Exercise 2 - Zeros and vertex from factored form



Graph of $f(x) = 2(x - 3)(x + 1)$.

For $f(x) = 2(x - 3)(x + 1)$, find the zeros, the axis of symmetry, and the vertex.

Exercise 3 - Read vertex form

Identify the vertex and decide whether it is a maximum or minimum: $f(x) = -(x+2)^2 + 5$.

Exercise 4 - Vertex from standard form

Find the vertex of $f(x) = x^2 - 8x + 11$ using $x = -\frac{b}{2a}$.

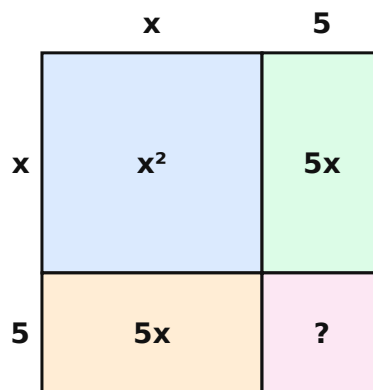
Exercise 5 - Factor to find zeros

Find the zeros of $x^2 - 5x - 14$.

Exercise 6 - Factor with a leading coefficient

Factor $3x^2 + 10x - 8$ and find its zeros.

Exercise 7 - Complete the square, area model



Find the missing corner.

Find the number that completes the square in $x^2 + 10x$, then write the trinomial as a square.

Exercise 8 - Complete the square

Rewrite $x^2 - 10x + 3$ in vertex form.

Exercise 9 - Complete the square, $a = 2$

Rewrite $2x^2 + 12x + 7$ in vertex form and state the vertex.

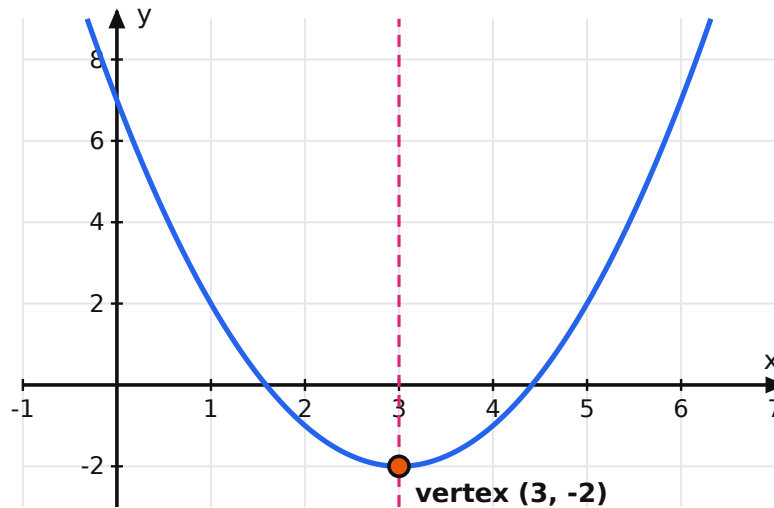
Exercise 10 - Odd coefficient

Rewrite $x^2 + 3x + 1$ in vertex form.

Exercise 11 - Vertex and axis

Write $f(x) = x^2 + 4x + 9$ in vertex form. Give the vertex, the axis of symmetry, and the minimum value.

Exercise 12 - Equation from the graph, vertex



Vertex (3, -2); the curve passes through (5, 2).

The parabola has vertex (3, -2) and passes through (5, 2). Write its equation in vertex form.

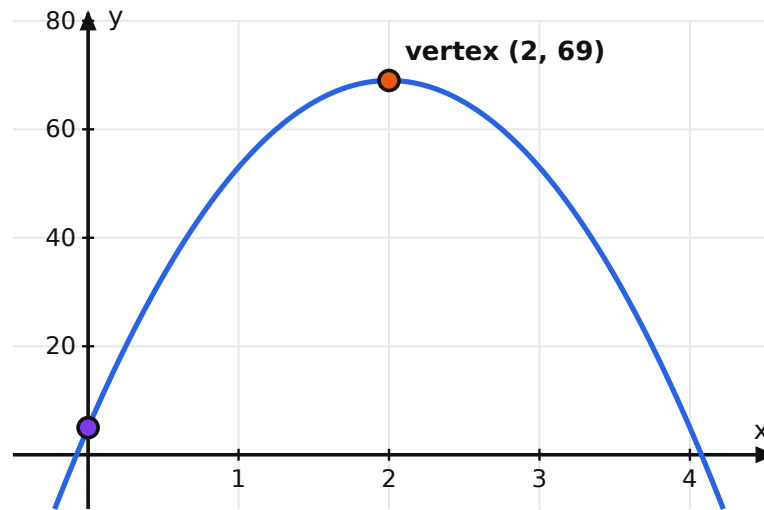
Exercise 13 - Equation from zeros

A parabola has zeros at -1 and 5 and passes through (0, -5). Write its equation in factored form.

Exercise 14 - Maximum value

Find the maximum value of $f(x) = -2x^2 + 8x + 1$ and where it occurs.

Exercise 15 - Thrown ball



$$h(t) = -16t^2 + 64t + 5.$$

A ball's height in feet is $h(t) = -16t^2 + 64t + 5$. Complete the square to find the maximum height and when it occurs.

Exercise 16 - Revenue

A club sells T-shirts at price p dollars, earning $R(p) = -5p^2 + 100p$ dollars. Write R in vertex form and in factored form. What price maximizes revenue?

Exercise 17 - Fence

Diego has 80 feet of fencing for a rectangular pen. The area is $A(w) = w(40 - w)$ square feet for width w . Find the zeros and the dimensions that give the greatest area.

Exercise 18 - Show two forms are equal

Show that $(x-3)^2 - 4 = (x-1)(x-5)$.

Exercise 19 - Which form?

Goal	Best form
Find the zeros	Factored
Find the vertex	Vertex
Find the y-intercept	Standard

Match each goal to a form.

A quadratic is given as $f(x) = (x-2)^2 - 9$. Without graphing, find its vertex, its zeros, and its y-

intercept.

Exercise 20 - Find the error

Liam wrote $x^2+8x+3=(x+4)^2+3$. Find his error and write the correct vertex form.

Exercise 21 - No x-intercepts

Explain why $f(x)=(x-2)^2+3$ has no x-intercepts.