

Precalculus - Transformations of Graphs - Worksheet

Common Core F-BF.B.3, F-IF.C.7b · maths-pdf.fr/en/

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

These 20 problems practice transformations of graphs (Common Core F-BF.B.3 and F-IF.C.7b). You will describe shifts, reflections and stretches, move points, write equations from graphs and test for even and odd functions.

Precalculus · Common Core State Standards: **F-BF.B.3, F-IF.C.7b**

Exercise 1 - Read a horizontal shift

Describe how the graph of $y = (x+3)^2$ is related to $y = x^2$.

Exercise 2 - Read a vertical shift

Describe how $y = \sqrt{x} - 5$ is related to $y = \sqrt{x}$.

Exercise 3 - Reflection

Describe how $y = -|x|$ is related to $y = |x|$.

Exercise 4 - Vertical stretch

Describe how $y = 2x^3$ is related to $y = x^3$.

Exercise 5 - Move a point

The point $(2,5)$ is on f . Find the matching point on $y = f(x-4)+1$.

Exercise 6 - Reflect and shift a point

The point $(3,-2)$ is on f . Find the matching point on $y = -f(x+1)+3$.

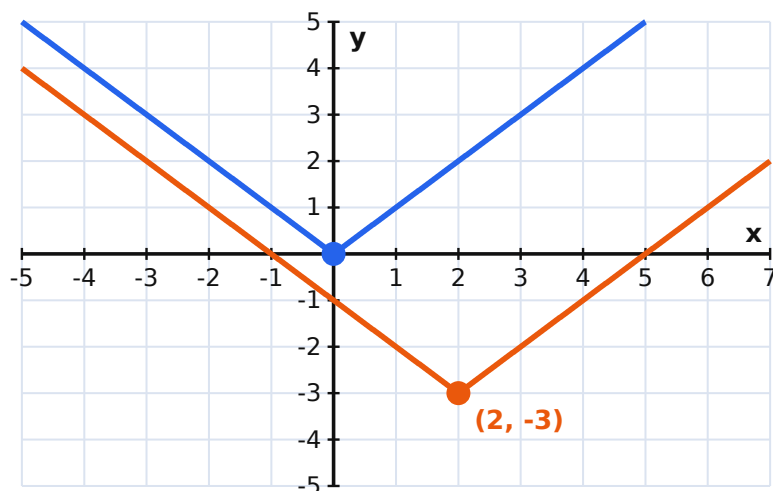
Exercise 7 - Write an equation

Write the equation of the graph of $y = x^2$ reflected over the x -axis, then shifted right 3 and down 2.

Exercise 8 - Vertex of a transformed parabola

Find the vertex of $y = 2(x+1)^2 - 6$ and tell whether it opens up or down.

Exercise 9 - Identify from a graph



Parent and transformed absolute value graphs.

The orange graph is a transformation of $y = |x|$. Write its equation.

Exercise 10 - Horizontal changes of a point

The point $(4, 6)$ is on f and $(3, -1)$ is on f . Find the matching points on $y = f(2x)$ and $y = f\left(\frac{x}{3}\right)$ respectively.

Exercise 11 - Even or odd?

Decide whether each function is even, odd or neither: (a) $f(x) = x^4 - 3x^2$; (b) $g(x) = x^3 + x$; (c) $h(x) = x^2 + x$.

Exercise 12 - Sequence of transformations

Describe the transformations that turn $y = \sqrt{x}$ into $y = -3\sqrt{x-2} + 1$, and find the value at $x = 6$.

Exercise 13 - Domain and range after shifts

State the domain and range of $y = \sqrt{x+4} - 3$.

Exercise 14 - Transform a table

x	-2	0	2	4
f(x)	1	3	-1	2

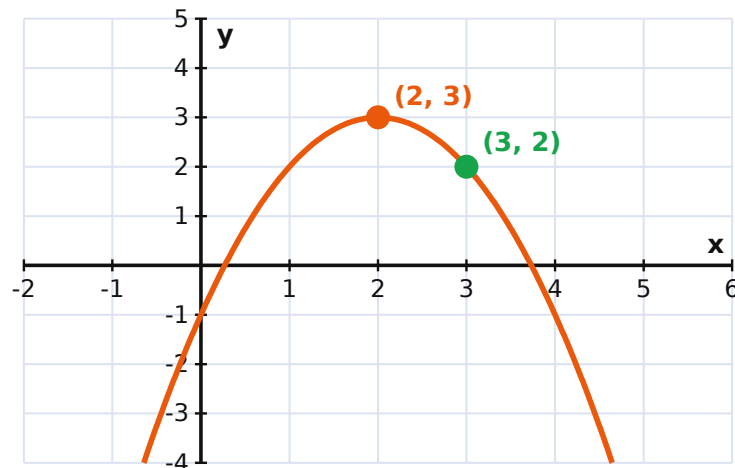
Values of f.

Make a table for $g(x) = f(x-2)+1$.

Exercise 15 - Reflect over the y-axis

Give the domain of $y = \sqrt{-x}$ and the matching point for $(9,3)$ on $y = \sqrt{x}$.

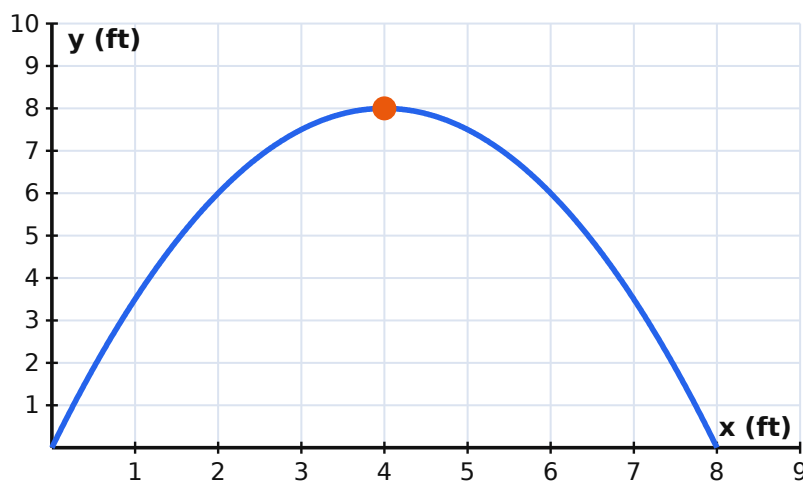
Exercise 16 - Equation from a graph



A parabola from a transformation of $y = x^2$.

The parabola has vertex $(2,3)$, opens down and passes through $(3,2)$. Write its equation in the form $y = a(x-h)^2 + k$.

Exercise 17 - Fountain



Water path of Sofia's fountain.

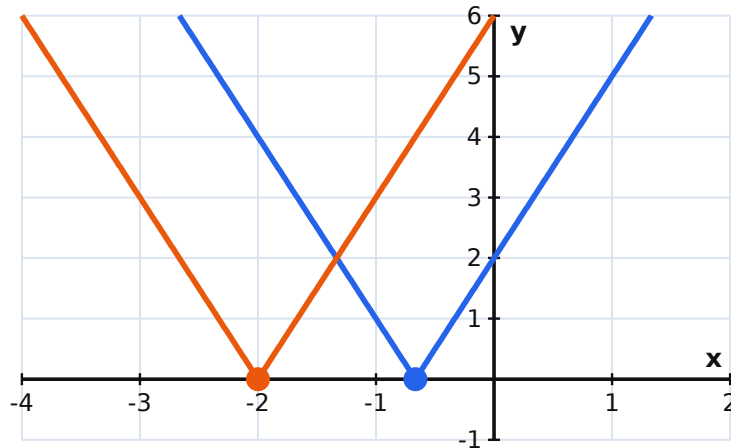
Water from Sofia's garden fountain follows $y = -0.5(x-4)^2 + 8$, with x and y in feet. Find the

greatest height, the horizontal distance where it lands at $y=0$ (besides $x=0$), and describe the transformations of $y=x^2$.

Exercise 18 - Taxi fare transformation

A taxi fare is $f(m)=2.5m$ dollars for m miles. A new company charges $N(m)=0.8(2.5m)+4$. Describe the transformation of f and find $N(10)$.

Exercise 19 - Who is right?



Two absolute value graphs.

Maya says $y=|3x+2|$ compresses $y=|x|$ horizontally by $\frac{1}{3}$ and then shifts it left 2. Is she right? Write the correct equation.

Exercise 20 - All features of a transformed parabola

For $g(x)=-2(x+1)^2+5$, find the vertex, the range, the y -intercept and the x -intercepts to the nearest hundredth.