

11.17 Quiz: Function transformations

1. The standard form of a linear equation is $ax + by = c$, where x and y are variables and a , b , and c are parameters (fixed numbers).

The equation of a line is $5x + 3y = -7$. Write down the value of each parameter.

(a) $a =$

(b) $b =$

(c) $c =$

2. The slope-intercept form of a linear equation is $y = mx + b$. The parameter m quantifies the slope and b the y -intercept.

For the equation $y = -\frac{3}{2}x + 4$, write down the value of each parameter..

(a) $m =$

(b) $b =$

3. The point-slope form of a linear equation is $y - k = m(x - h)$. The parameter m represents the slope. The parameters h and k are the coordinates of a point that the line passes through, (h, k) .

For the equation $y - 2 = -9(x + 5)$, write down the value of each parameter.

(a) $m =$

(b) $h =$

(c) $k =$

(d) Write down a point that the line passes through as a coordinate pair.

4. Rewrite each equation in the specified form.

(a) $y = 2x - 5$ in the form $ax + by = c$ (b) $y - 2 = \frac{1}{2}(x + 6)$ in the form $y = mx + b$

5. (a) Find the slope m of the line $6x - 2y = 10$.

(b) Write down the slope perpendicular to the line, m_{\perp} .

6. Write down the slope perpendicular to the given slope.

(a) $m = -\frac{5}{2}$ $m_{\perp} =$

(b) $m = -1$ $m_{\perp} =$

7. Write down the equation of the line through $(3, -7)$ with a slope of 5.

8. The line segment \overline{AB} , $A(2, 7)$ and $B(8, 3)$, is shown below.

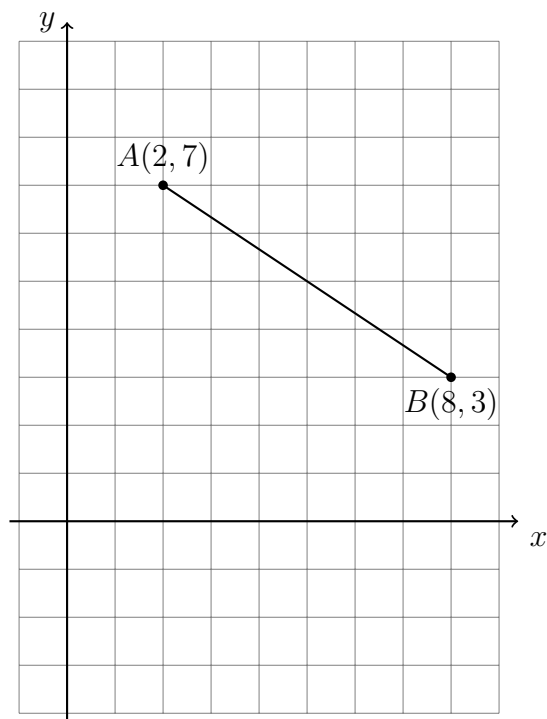
(a) Mark the midpoint M of \overline{AB} . Label it as an ordered pair.

(b) Find the slope of \overline{AB} .

(c) Write down the slope perpendicular to \overline{AB} .

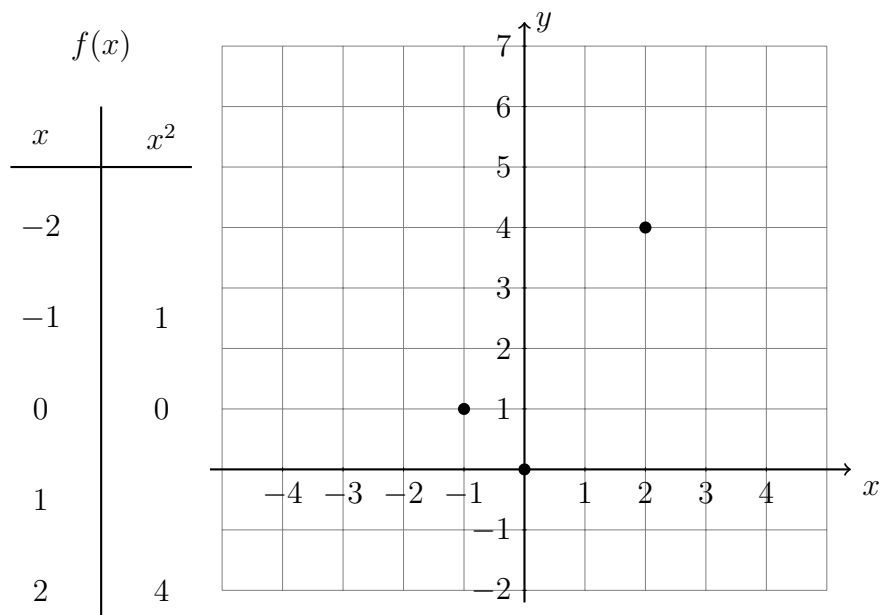
(d) Write down the equation of the perpendicular bisector of \overline{AB} .

(e) Draw the perpendicular bisector on the graph using a straight edge.

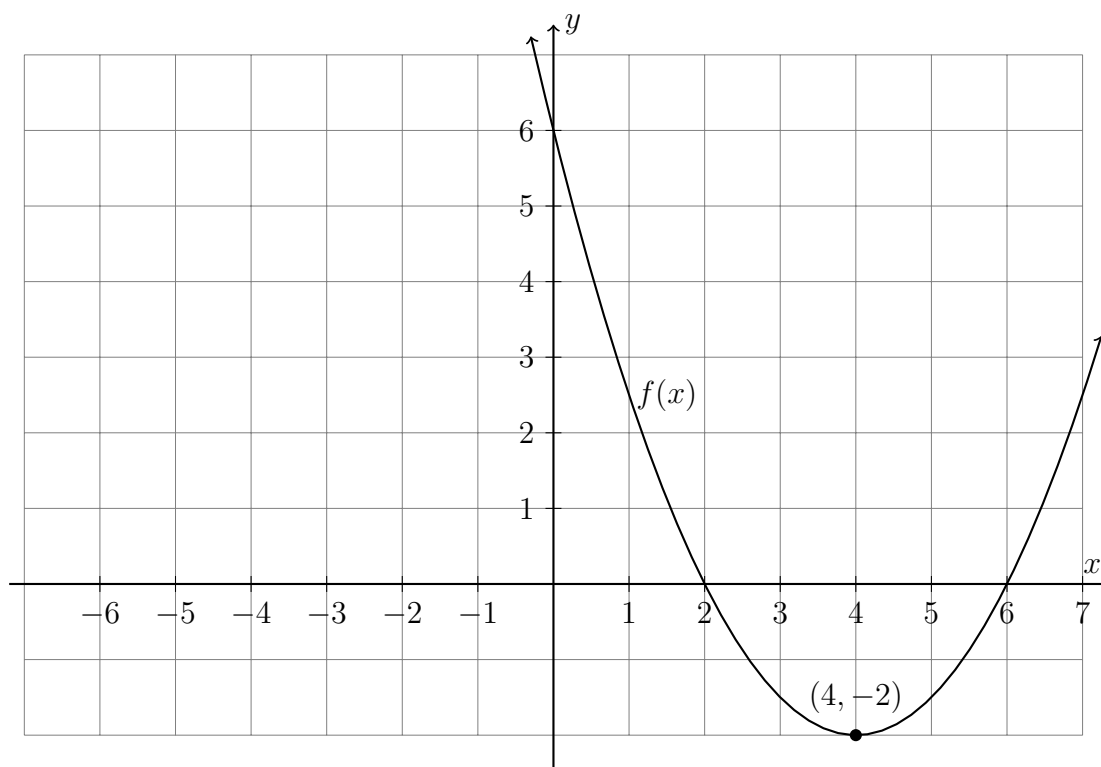


Name:

9. Complete the t-table for the parent function $f: y = x^2$, plot the points, and draw f as a smooth curve.



10. The parabola $f(x) = \frac{1}{2}(x - 4)^2 - 2$ graphed below. Reflect f across the y -axis. Mark and label the image parabola's x -intercepts and vertex.



11. The line l having the equation $y - 2 = -\frac{2}{3}(x - 3)$ is shown below.

(a) Write down coordinates of P .

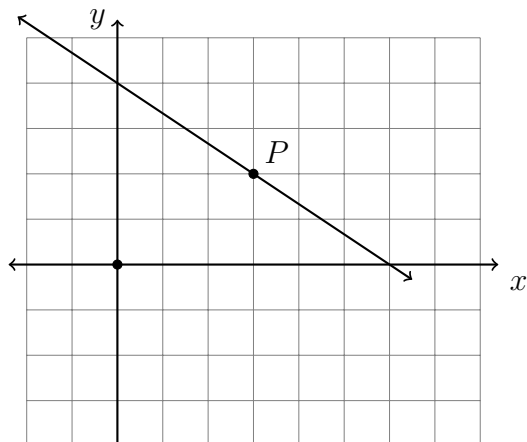
(b) Point P is mapped to the origin by

$$x \rightarrow x - h$$

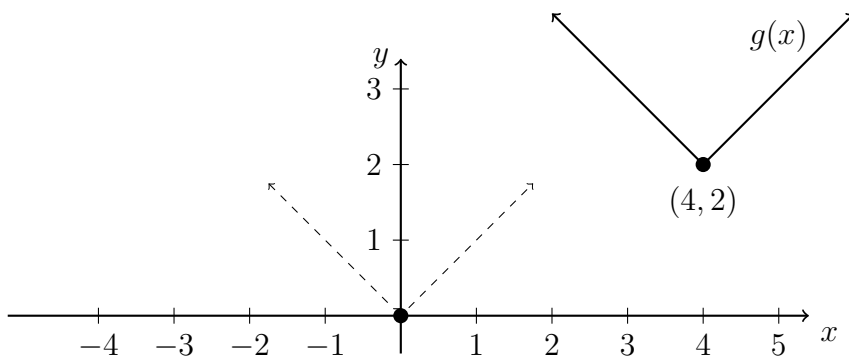
$$y \rightarrow y - k$$

Write down h and k .

(c) Plot the image of l after the translation.



12. The function $g : y = |x - 4| + 2$ is plotted below as a solid line. What translation would map g onto the parent function (dotted)? State your answer in the form $x \rightarrow x - h$, $y \rightarrow y - k$.



13. The line \overleftrightarrow{RS} having the equation $y = \frac{2}{3}x + 2$ is shown below.

(a) Write down the slope of \overleftrightarrow{RS} ,

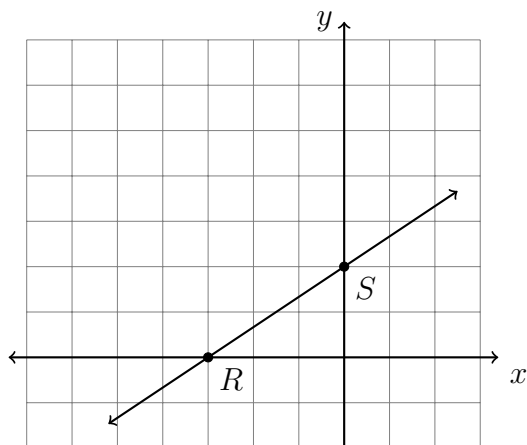
$$m =$$

(b) Write down the y -intercept of \overleftrightarrow{RS} ,

$$b =$$

(c) Dilate \overleftrightarrow{RS} by a scale factor $k = 2$ centered at the origin. Mark and label the images R' and S' .

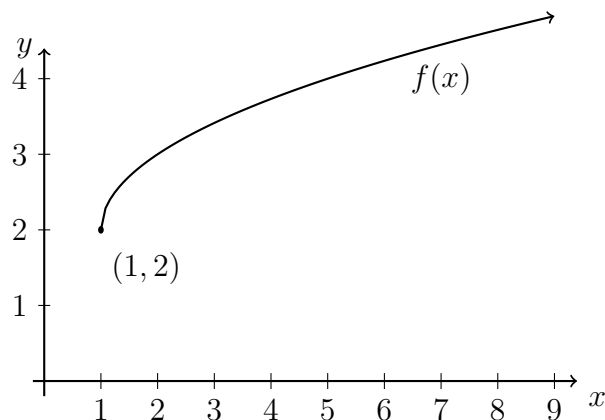
(d) Write down the equation of $\overleftrightarrow{R'S'}$.



Name:

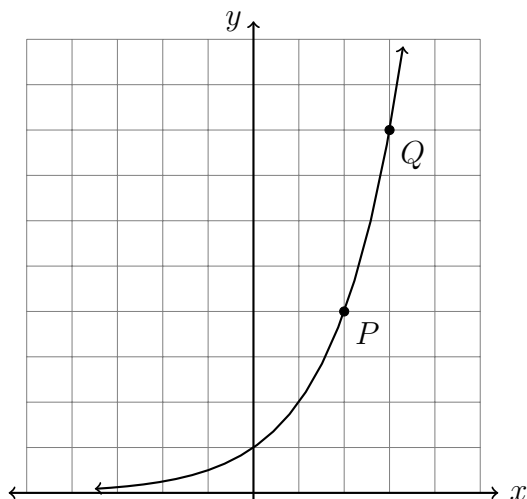
14. The function f is plotted below for $x \geq 1$. Identify the equation of $f(x)$.

- (a) $f(x) = (x - 1)^2 + 2$
- (b) $f(x) = |x - 1| + 2$
- (c) $f(x) = \sqrt{x - 1} + 2$
- (d) $f(x) = \sin(x - 1) + 2$



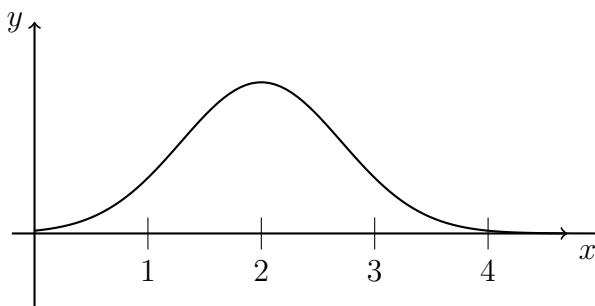
15. Part of the exponential function $f: y = 2^x$, is shown below.

- (a) Reflect f across the y -axis.
- (b) Write down the coordinates of P and Q .
- (c) Mark and label the images P' and Q' with their coordinates.



16. The function f is plotted below for $x \geq 0$. Identify the function represented by the graph.

- (a) Reciprocal function $y = \frac{1}{x - 2}$
- (b) Principal square root $f(x) = \sqrt{x - 2}$
- (c) Quadratic function $y = (x - 2)^2$
- (d) Normal distribution $N(\mu, \sigma)$

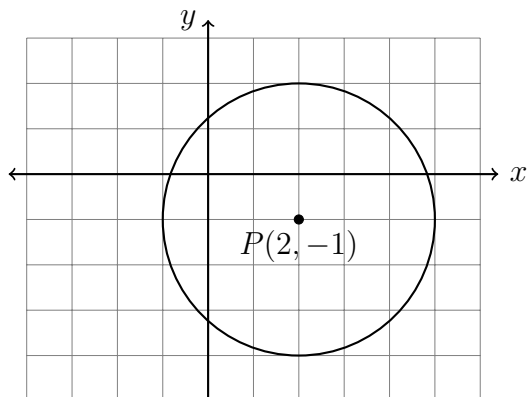


17. The circle with center P shown below can be represented by an equation of the form $(x - h)^2 + (y - k)^2 = r^2$. Write down the values of the parameters.

(a) $r =$

(b) $h =$

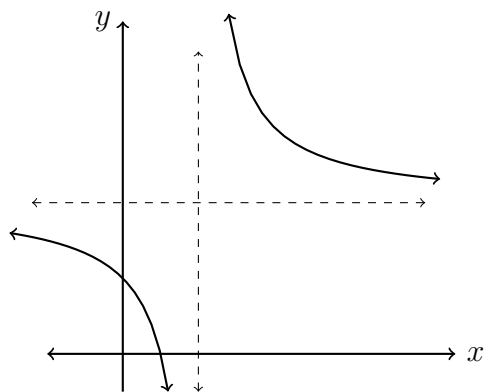
(c) $k =$



18. The reciprocal function shown below has the equation $f(x) = \frac{1}{x - 1} - 2$. Its asymptotes are plotted as dashed lines.

- (a) Write down the equation of the horizontal asymptote.

- (b) Write down the equation of the vertical asymptote.



19. The sine function shown below has the form $f(x) = a \sin x + d$, where the coefficient a is the vertical stretch factor and the parameter d is the vertical translation. f passes through the points $(90^\circ, 3)$ and $(270^\circ, -1)$.

Write down the parameter values:

(a) $a =$

(b) $d =$

