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 the h are the coordinates of a point that the line passes through.

   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) $m = -\frac{5}{2}$ $\quad m_\perp =$ $\quad$ (b) $m = -1$ $\quad m_\perp =$

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.

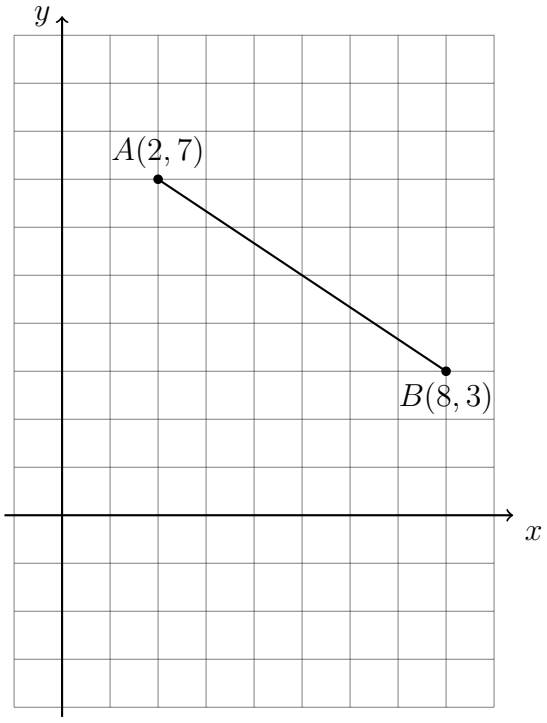
   (a) Mark the midpoint M of $\overline{AB}$. Label it as an ordered pair.

   (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 $\overline{AB}$.

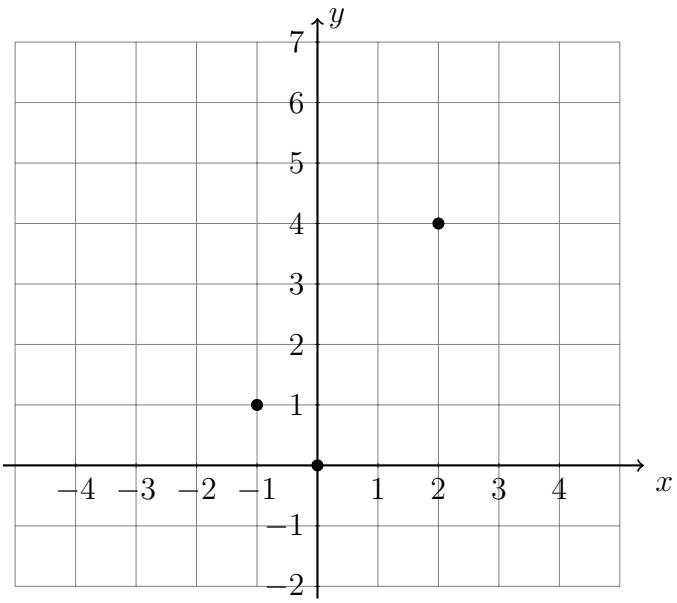
   (e) Draw the perpendicular bisector on the graph using a straight edge.



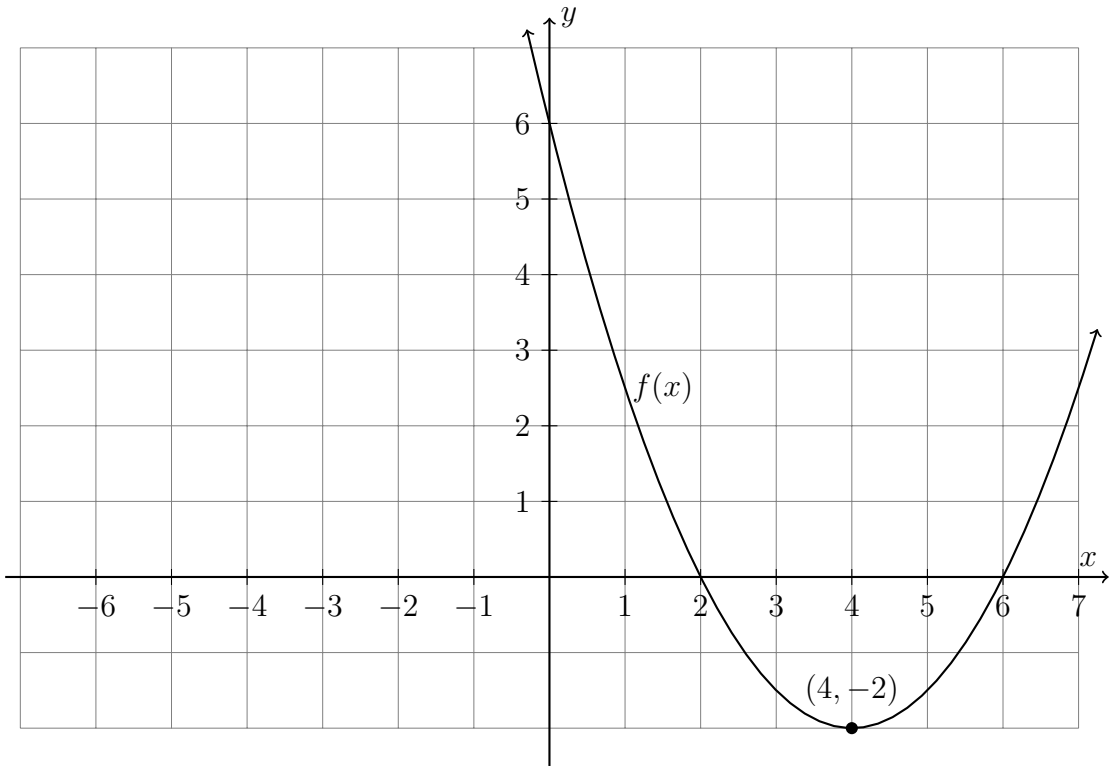
9. Complete the t-table for the parent function f: $y = x^2$, plot the points, and draw f as a smooth curve.

$f(x)$

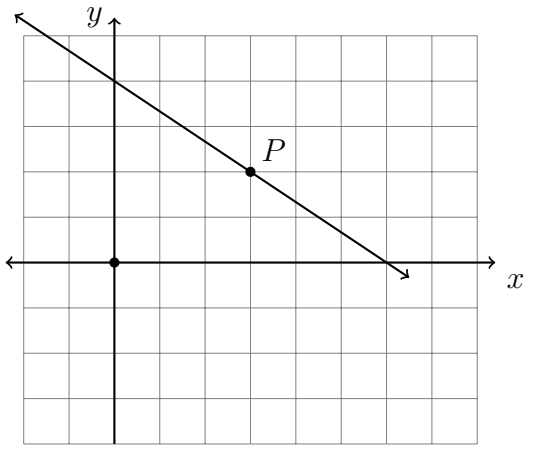
x	x^2
-2	
-1	1
0	0
1	
2	4



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.

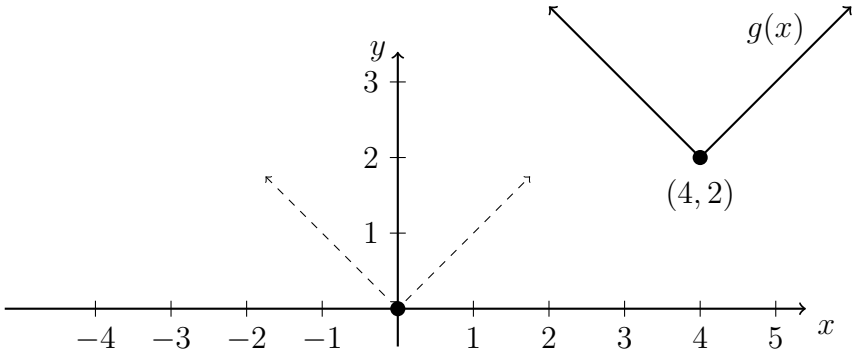


(a) Write down coordinates of P.

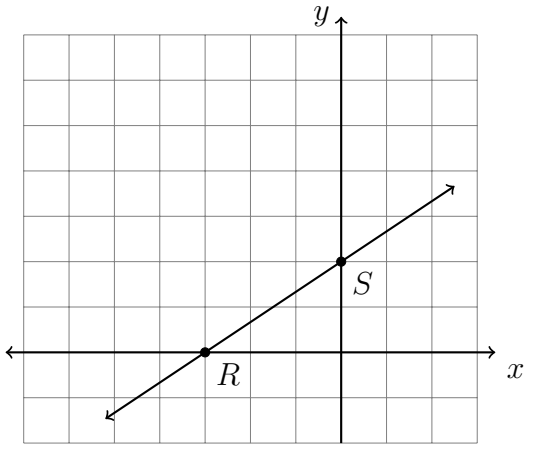
(b) Point P is mapped to the origin by
$x \to x - h$
$y \to y - k$
Write down h and k.

(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 $x \to x - h$, $y \to y - k$.



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 the images R' and S'.

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

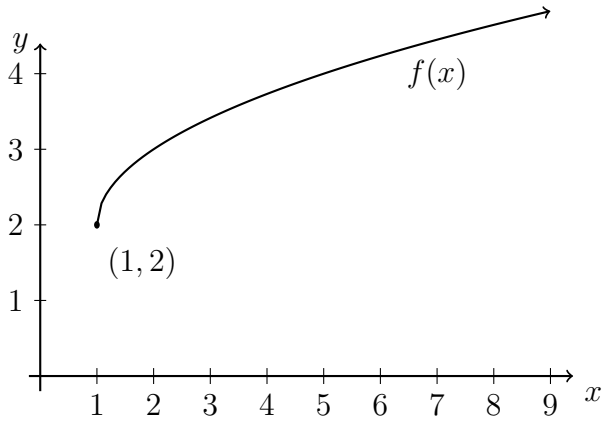
14. The function f is plotted below for $x \geq 1$. Identify the equation of $f(x)$.

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

(b) $f(x) = |x-1| + 2$

(c) $f(x) = \sqrt{x-1} + 2$

(d) $f(x) = \sin(x-1) + 2$

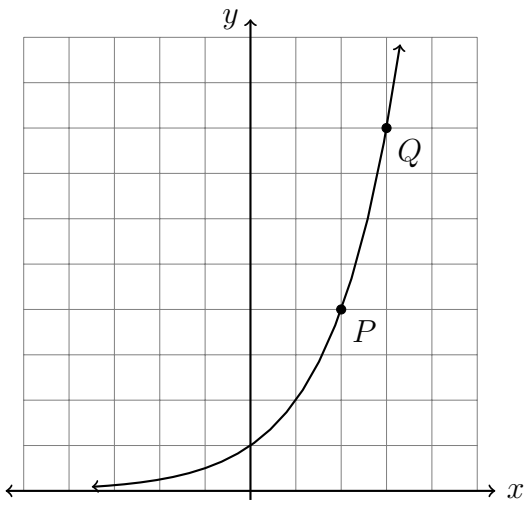


15. Part of the exponential function f: $y = 2^x$, is shown below.

(a) Reflect f across the x-axis.

(b) Write down the coordinates of P and Q.

(c) Mark and label the images P' and Q' with their coordinates.



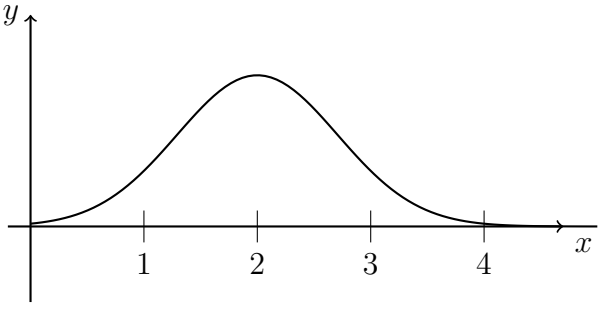
16. The function f is plotted below for $x \geq 0$. Identify the function represented by the graph.

(a) Reciprocal function $y = \dfrac{1}{x-2}$

(b) Principal square root $f(x) = \sqrt{x-2}$

(c) Quadratic function $y = (x-2)^2$

(d) Normal distribution $N(\mu, \sigma)$

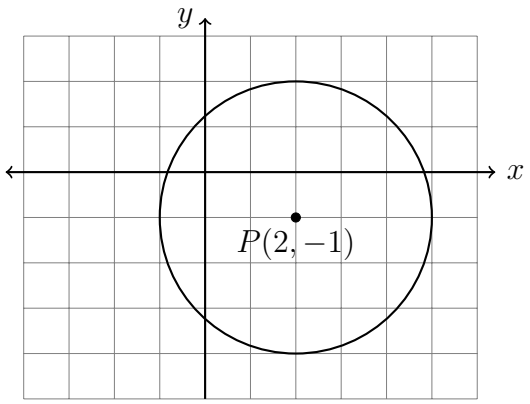


17. The circle with center P shown below can be represented by an equation of the form $(x-h)^2+(y-k)^2=r^2$. Write down the values of the parameters.

(a) $r=$

(b) $h=$

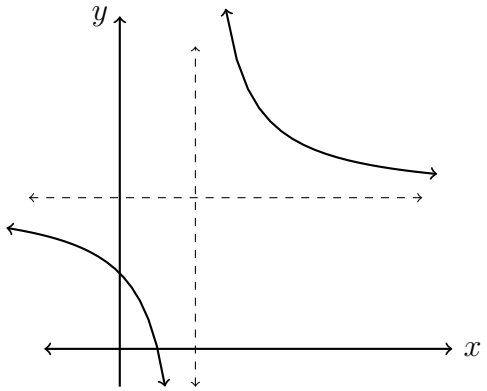
(c) $k=$



18. The reciprocal function shown below has the equation $f(x)=\dfrac{1}{x-1}-2$. 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 $(90°, 3)$ and $(270°, -1)$.

Write down the parameter values:

(a) $a=$

(b) $d=$