

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) $a = 5$

(b) $b = 3$

(c) $c = -7$

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) $m = -\frac{3}{2}$

(b) $b = 4$

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.

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

(a) $m = -9$

(b) $h = -5$

(c) $k = 2$

- (d) Write down a point that the line passes through as a coordinate pair. $(-5, 2)$

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 $y = mx + b$

$$-2x + y = -5$$

$$y = \frac{1}{2}x + 5$$

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

$$y = 3x - 5$$

$$m = 3$$

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

$$-\frac{1}{3}$$

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

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

$$m_{\perp} = \frac{2}{5}$$

(b) $m = -1$

$$m_{\perp} = 1$$

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

$$y + 7 = 5(x - 3)$$

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} .

$$m = -\frac{4}{6} = -\frac{2}{3}$$

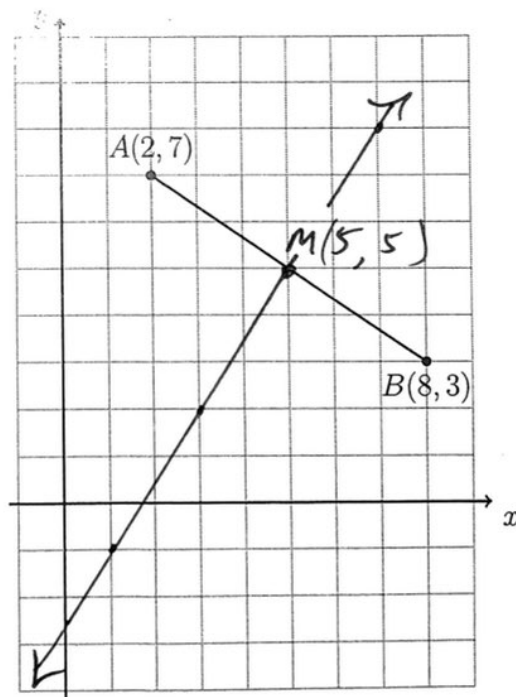
- (c) Write down the slope perpendicular to \overline{AB} .

$$m_{\perp} = +\frac{3}{2}$$

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

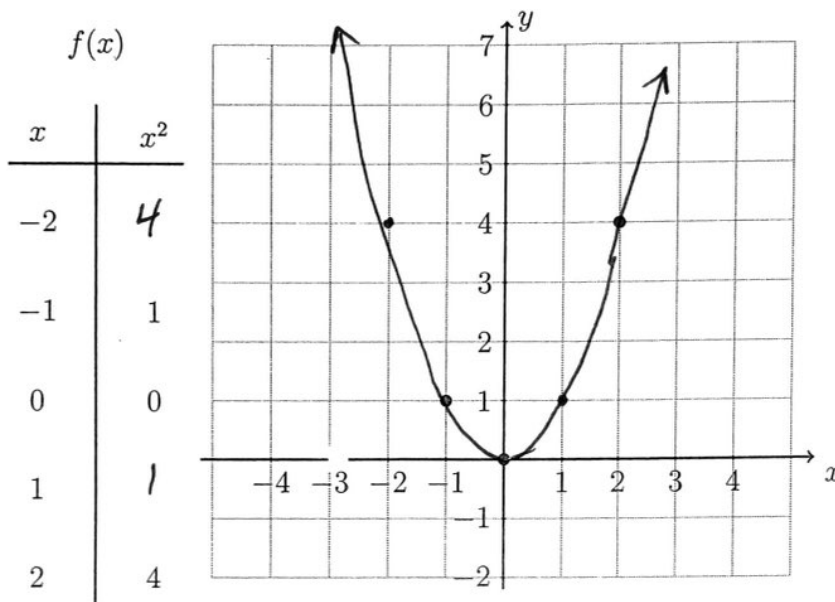
$$y - 5 = \frac{3}{2}(x - 5)$$

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

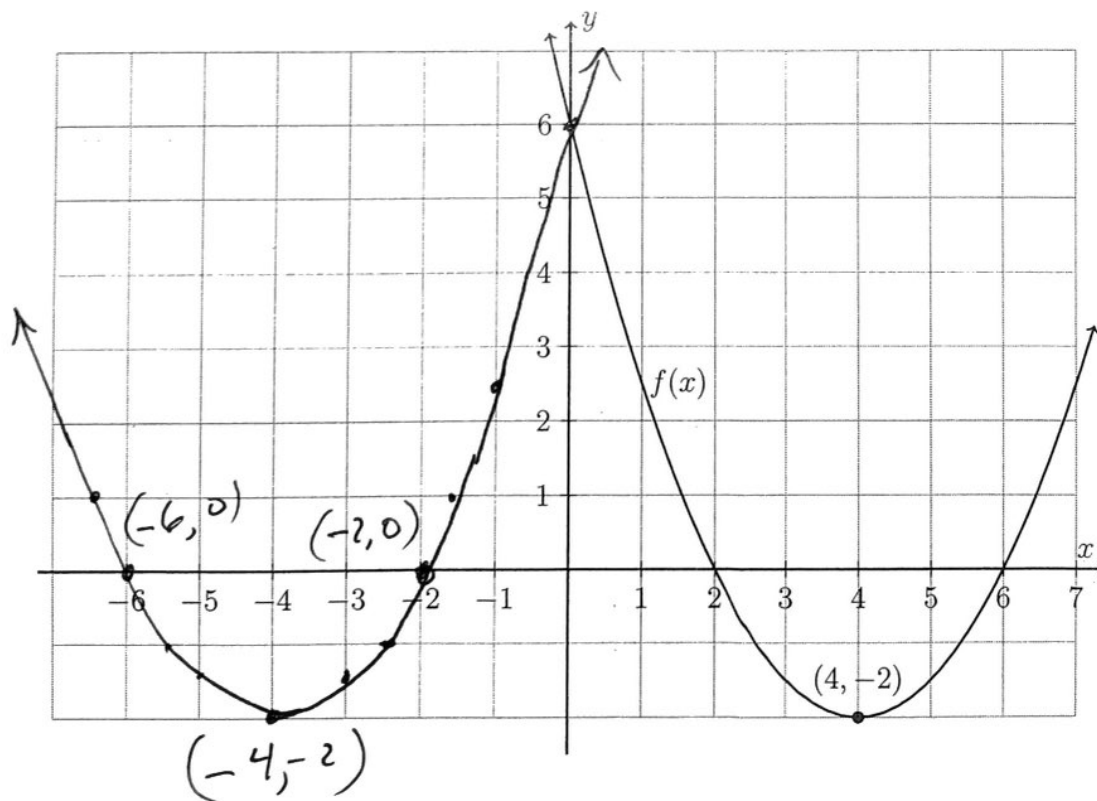


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9. Complete the t-table for the parent function $f: y = x^2$, plot the points, and draw f as a smooth curve.



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 .

$(3, 2)$

(b) Point P is mapped to the origin by

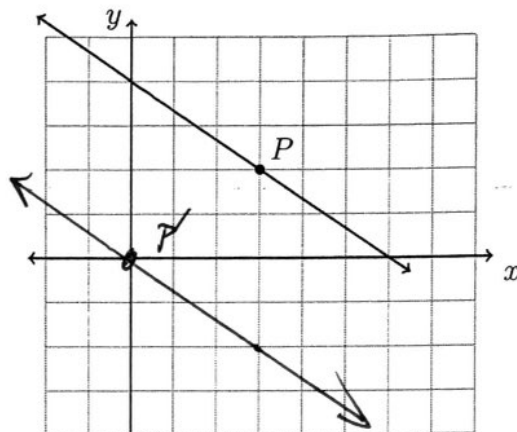
$$x \rightarrow x - h$$

$$y \rightarrow y - k$$

Write down h and k .

$+3, +2$

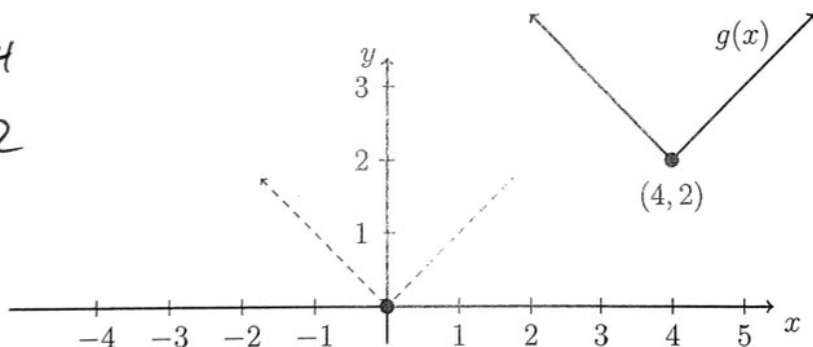
(c) Plot the image of l after the translation.



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 $x \rightarrow x - h$, $y \rightarrow y - k$.

$$x \rightarrow x - 4$$

$$y \rightarrow y - 2$$



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} ,

$$m = \frac{2}{3}$$

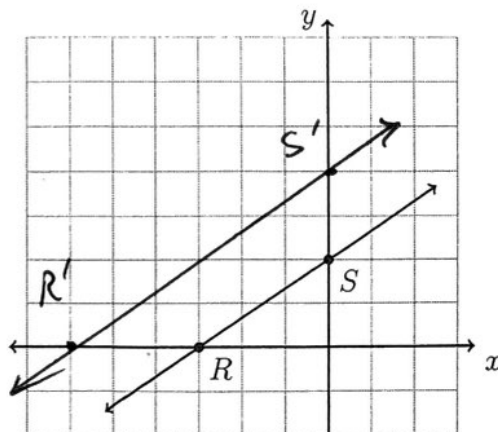
(b) Write down the y -intercept of \overleftrightarrow{RS} ,

$$b = 2$$

(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 $\overleftrightarrow{R'S'}$

$$y = \frac{2}{3}x + 4$$



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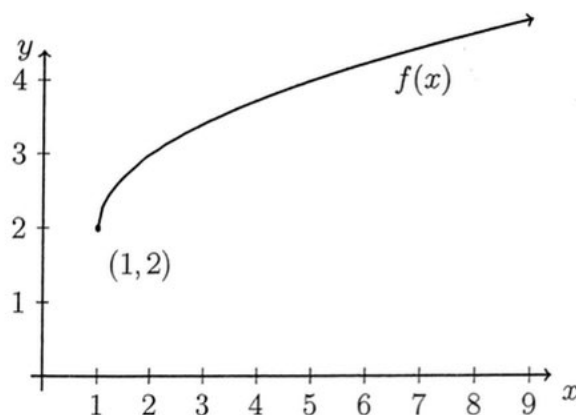
14. The function f is plotted below for $x \geq 1$. Identify the equation of $f(x)$.

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

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

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

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



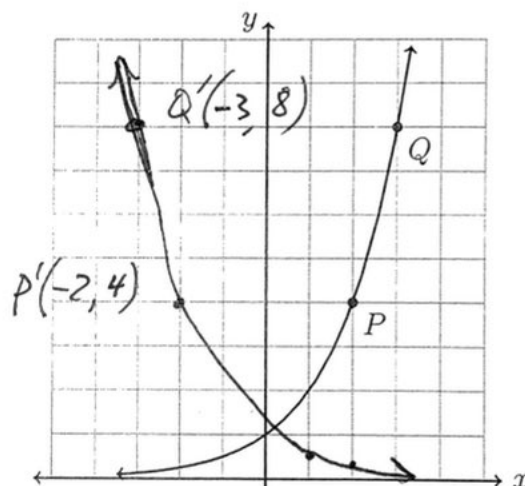
15. Part of the exponential function $f: y = 2^x$, is shown below.

(a) Reflect f across the x -axis.

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

$P(2, 4)$
 $Q(3, 8)$

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



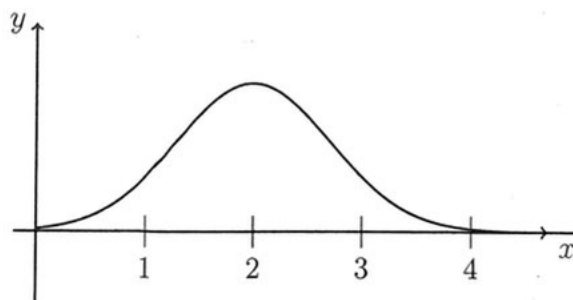
16. The function f is plotted below for $x \geq 0$. Identify the function represented by the graph.

(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 $N(\mu, \sigma)$

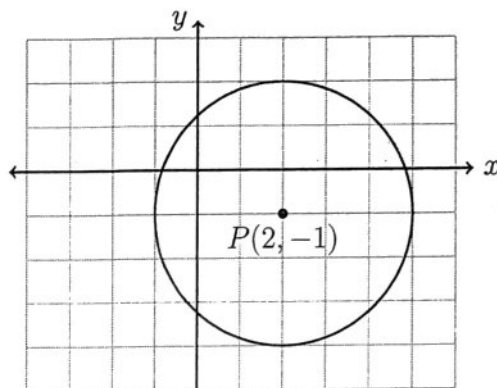


17. The circle with center P shown below can be represented by an equation of the form $(x - h)^2 + (y - k)^2 = r^2$. Write down the values of the parameters.

(a) $r = 3$

(b) $h = 2$

(c) $k = -1$



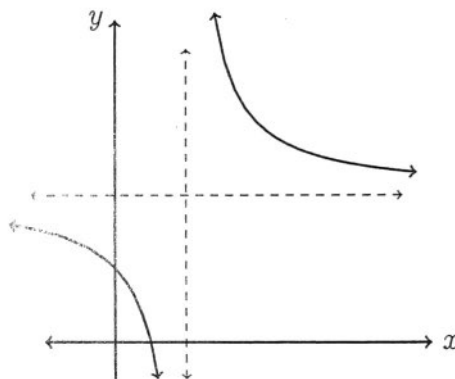
18. The reciprocal function shown below has the equation $f(x) = \frac{1}{x-1} - 2$. Its asymptotes are plotted as dashed lines.

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

$$y = 2$$

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

$$x = 1$$



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) $a = 2$

(b) $d = 1$

