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$$g(x) = 2(x-3)^2 + 10$$

vertical stretching
horizontal shift
vertical shift

horizontal shift: 3 units to the right
(input is modified)

vertical transformations:
(output is modified)

- vertical stretching: every y-coordinate is multiplied by 2
- vertical shift: 10 units up
(every y-value + 10)

#15

We need to check that

$$(g \circ f)(x) = x \quad \text{and} \quad (f \circ g)(x) = x$$

$$\begin{aligned} (g \circ f)(x) &= g(f(x)) = g\left(\frac{2}{x-5}\right) = \frac{2}{x-5} + 5 \\ &= \frac{2}{1} \cdot \frac{x-5}{2} + 5 = x-5 + 5 = x \quad \checkmark \end{aligned}$$

$$\begin{aligned} (f \circ g)(x) &= f(g(x)) = f\left(\frac{2}{x} + 5\right) = \frac{2}{\frac{2}{x} + 5} - 5 \\ &= \frac{2}{\frac{2}{x} + 5 - 5} = \frac{2}{\frac{2}{x}} = \frac{2}{1} \cdot \frac{x}{2} = x \quad \checkmark \end{aligned}$$

Therefore, f and g are inverse functions