There are many correct answers for this one:

$f(x) = \frac{3}{x}$; $g(x) = \sqrt{8x+7}$

or $f(x) = \frac{3}{\sqrt{x}}$; $g(x) = 8x + 7$

or $f(x) = \frac{3}{\sqrt{x+7}}$; $g(x) = 8x$.

$$(f \circ g)(x) = \frac{1 + \frac{1}{x-1}}{\frac{1}{x-1}} = \frac{\frac{x-1+1}{x-1}}{\frac{1}{x-1}} = \frac{\frac{x}{x-1}}{\frac{1}{x-1}}$$

$$= \frac{x}{x-1} \cdot \frac{x-1}{1} = x$$

$$(g \circ f)(x) = \frac{1}{\frac{1+x}{x} - 1} = \frac{1}{\frac{1+x-x}{x}} = \frac{1}{\frac{1}{x}} = x.$$

So, $(f \circ g)(x) = x$ and $(g \circ f)(x) = x$.

So, f and g are inverses of each other.

The vertex is $(2,2)$. Plug the vertex to the standard form, we have:

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

The y-intercept is $(0,6)$. So,

$6 = a \cdot (-2)^2 + 2$. So, $6 = 4a + 2$. So, $a = 1$.

Equation for the quadratic function is:

$$\boxed{f(x) = (x-2)^2 + 2}$$

$(x^3 - 3) \div (x-1)$

1	1	0	0	−3
		1	1	1
	1	1	1	−2

Remainder

Quotient: $x^2 + x + 1$.