$y \geq 0$ FA #10

a) $f(x) = \frac{2x-3}{7}$

$y = \frac{2x-3}{7}$

$x = \frac{2y-3}{7}$

$7x = 2y - 3$

$7x + 3 = 2y$

$\frac{7x+3}{2} = y$

$f^{-1}(x) = \frac{7x+3}{2}$

b) $g(x) = \sqrt{x-5}, \quad x \geq 5$

Note: The restriction on the range is $y \geq 0$.

$y = \sqrt{x-5}$

$x = \sqrt{y-5}$

$x^2 = y - 5$

$x^2 + 5 = y$ $x \geq 0$ because of the restriction on the range of the square root function

$\therefore \; g^{-1}(x) = x^2 + 5, \quad x \geq 0$

c) $h(x) = 2(x-3)^2 + 5$

$y = 2(x-3)^2 + 5$

$x = 2(y-3)^2 + 5$

$x - 5 = 2(y-3)^2$

$\frac{1}{2}(x-5) = (y-3)^2$

$\pm\sqrt{\frac{1}{2}(x-5)} = y - 3$

$\pm\sqrt{\frac{1}{2}(x-5)} + 3 = y$

There is no restriction on the quadratic function, so the inverse of the quadratic is not a function. You cannot use inverse function notation.