① $t^2 - 8t + 15 \geq 0$

$(t-5)(t-3) \geq 0$

$t \leq 3$ or [redacted] $t \geq 5$

Using interval notations, $(-\infty, 3] \cup [5, \infty)$.

② $T(x+h) - T(x-h) = 3(x+h)^2 - 2(x+h) - \{3(x-h)^2 - 2(x-h)\}$

$= 3(x^2 + 2hx + h^2) - 2x - 2h - \{3(x^2 - 2hx + h^2) - 2x + 2h\}$

$= 3x^2 + 6hx + 3h^2 - 2x - 2h - 3x^2 + 6hx - 3h^2 + 2x - 2h$

$= 12hx - 4h$

③ Domain of f is the set of all real numbers, say $(-\infty, \infty)$.

$f(x) = x^2 - 2x = (x-1)^2 - 1$ gives the range of $f = [-1, \infty)$.

④ Since $y = x^2 - 8x + 2$ opens upward, it has the minimum value.

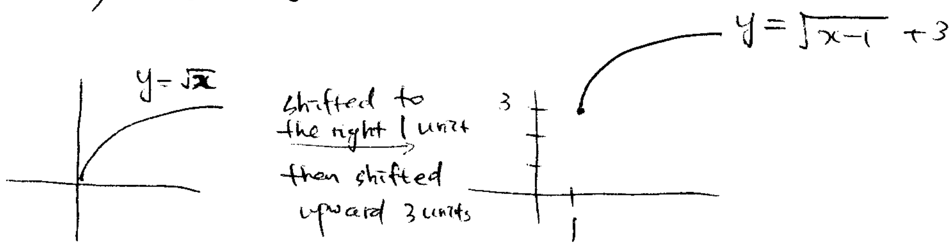
$y = (x-4)^2 - 14 \Rightarrow$ vertex $(4, -14)$ The minimum value is -14.

⑤ $f^{-1}(10) = -3 \iff f(-3) = 10$

$\Rightarrow \dfrac{2-2t}{2+2t} = -3 \Rightarrow 2 - 2t = -3(2+2t) \Rightarrow 2 - 2t = -6 - 6t$

$\Rightarrow 4t = -8 \Rightarrow t = -2$.

⑥



⑦ Looking at the inside of $f(x)$. Set $g(x) = x^2 - 4x + 20 \Rightarrow g(x) = (x-2)^2 + 16$.

$\Rightarrow$ g has the minimum value 16 at $x = 2$.

$\Rightarrow$ f has the minimum value $\sqrt{16} = 4$ at $x = 2$.

⑧ $(g \circ f)(x) = g(f(x)) = g(5x+1) = -2(5x+1) - 5 = -10x - 2 - 5 = -10x - 7$.

⑨