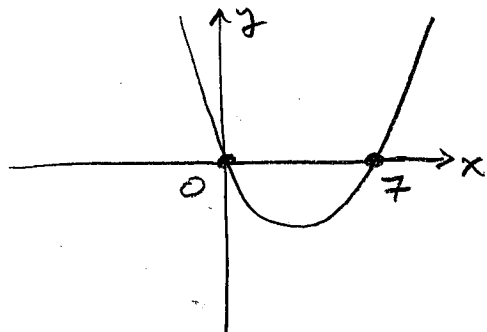**(1) [3]** Find the domain of $h(x) = \dfrac{1}{\sqrt{x^2 - 7x}}$.

We require $x^2 - 7x > 0$.
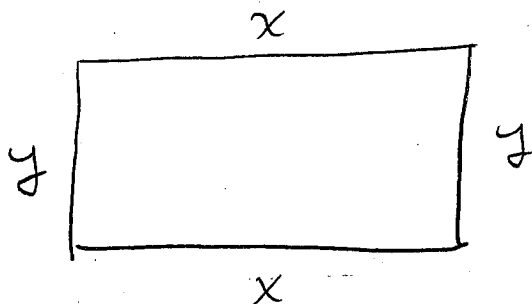
Graph of $y = x^2 - 7x = x(x-7)$ is

so $x^2 - 7x > 0$ for $x < 0, \ x > 7$

$\therefore$ Domain of h is

$$(-\infty, 0) \cup (7, \infty).$$

(2) [6] A rectangle has perimeter 20 m. Express the area of the rectangle as a function of the length x of one of its sides.

① $2x + 2y = 20$

② $A = xy$

① $\Rightarrow \ 2y = 20 - 2x$

$y = 10 - x$

$\therefore \ A = xy$

$$A = x(10 - x)$$, $\quad 0 < x < 10$

(3) [6] Let $f(x) = x^2 - 5x + 3$. Find and simplify $\dfrac{f(4+h) - f(4)}{h}$.

$$\frac{f(4+h) - f(4)}{h} = \frac{1}{h}\left(\left[(4+h)^2 - 5(4+h) + 3\right] - \left[4^2 - 5(4) + 3\right]\right)$$

$$= \frac{1}{h}\left[\cancel{16} + 8h + h^2 \cancel{-20} - 5h + \cancel{3} \cancel{-16} + \cancel{20} \cancel{-3}\right]$$

$$= \frac{h^2 + 3h}{h}$$

$$= \boxed{h + 3}$$