70. (a) We use coordinates with $+x$ rightward and $+y$ upward, with the usual conventions for measuring the angles (so that the final angle is written $90^\circ - 40^\circ = 50^\circ$). With SI units understood, the magnitude of the diver's momentum before contact is $(60.0)(3.00) = 180$ and after contact is $(60.0)(5.00) = 300$. Using magnitude-angle notation (quickly implemented using a vector capable calculator in polar mode), the change in momentum is

$$(300 \angle 50^\circ) - (180 \angle -90^\circ) = (453 \angle 65^\circ) \ .$$

This equals the *total* impulse delivered to the diver (by the board and by gravity). If $F_{\text{net}}$ denotes the magnitude of the average *net* force exerted on the diver, then we have

$$F_{\text{net}}\Delta t = 453 \implies F_{\text{net}} = \frac{453}{1.2} = 377 \text{ N} \ .$$

(b) Since $\vec{F}_{\text{net}} = (377 \angle 65^\circ)$ and the weight of the diver is $(588 \angle -90)$, we obtain

$$(377 \angle 65^\circ) - (588 \angle -90^\circ) = (943 \angle 80^\circ) \ .$$

Therefore, the magnitude of the average force exerted by the board on the diver is 943 N.