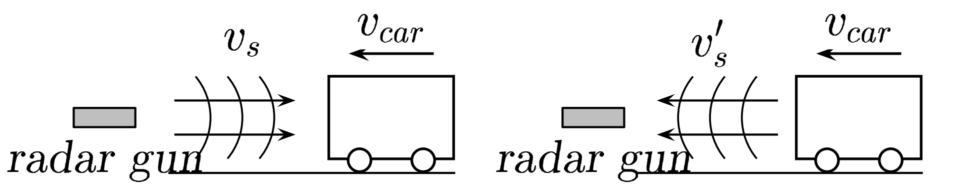
Consider a stationary policeman, using a speed-detecting-device (radar gun)which emits sound waves, aimed at an oncoming car, and detects the reflected sound waves from the car.
To determine the speed of the car we combine two Doppler-shifts.

A: Police device emits sound waves with frequency f_0.
Driver in the car may detect a frequency, f_1.

B: The car reflects sound waves with this same f_1.
Detected reflected waves has a frequency $f_2 = 1.5\, f_0$.



(A: incident wave) (B: reflected wave)

A) $A:\ f_1 = \dfrac{v_s + v_c}{v_s} f_0$ and $B:\ f_2 = \dfrac{v_s + v_c}{v_s} f_1$.

B) $A:\ f_1 = \dfrac{v_s + v_c}{v_s} f_0$ and $B:\ f_2 = \dfrac{v_s}{v_s - v_c} f_1$.

C) $A:\ f_1 = \dfrac{v_s}{v_s - v_c} f_0$ and $B:\ f_2 = \dfrac{v_s + v_c}{v_s} f_1$.

D) $A:\ f_1 = \dfrac{v_s}{v_s - v_c} f_0$ and $B:\ f_2 = \dfrac{v_s}{v_s - v_c} f_1$.

By inspection, answer is B.

This leads to $f_2 = \dfrac{v_s}{v_s - v_c} f_1 = \dfrac{v_s + v_c}{v_s + v_c} f_0$. (1)

$\left[\text{For radar } f_2 = \sqrt{\dfrac{v_s + v_c}{v_s + v_c}}\, f_0 . \right]$

Answer **B**