3.1.53

Exercise 3.1.53 The linear function $F(C) = \frac{9}{5}C + 32$ converts degrees Celsius to degrees Fahrenheit, and the linear function $R(F) = F + 459.67$ converts degrees Fahrenheit to degrees Rankine. Find a linear function that converts degrees Rankine to degrees Celcius.

Solution

Slightly modifying the function notation, we have $F = \frac{9}{5}C + 32$ and $R = F + 459.67$.

Substituting the first equation into the second gives $R = F + 459.67 = \left(\frac{9}{5}C + 32\right) + 459.67$

$$= \frac{9}{5}C + 491.67.$$

So the linear function that converts degrees Rankine to degrees Celcius is

$$\boxed{R(C) = \frac{9}{5}C + 491.67}.$$ □