5th exercise:

1a) Using option-I: "Pay 3€ for every traveled Km"

then, $\boxed{f(x) = 3x}$

Using option-II: $g(x) = 10€ + 3\left(1 - \frac{30}{100}\right)x$

Thus, $g(x) = 10 + 2.1x$.

b) To check which offer is more beneficial, $x = 13$ we compare $f(13)$ & $g(13)$

$f(13) = 13(3) = 39€$ | $g(13) = 10 + 2.1(13) = 37.3€$

Since $f(13) > g(13)$

Thus, option II is more advantageous for traveled distance is 13 Km

2) option-I is more advantageous than option-II if amount of money $f(x)$ is less than $g(x)$

$3x < 10 + 2.1x$

$0.9x < 10$

$x < 11.11$ Km.

where as option II is more advantageous if traveled distance is strictly greater than 11.11 Km

6th exercise:

1) $\begin{cases} x^2 - 4 \geq x(x+4) & \text{--- (1)} \\ x^2 > -1 & \text{--- (2)} \end{cases}$

Inequality (1):

$x^2 - 4 \geq x(x+4)$

$-4 \geq 4x$

$\boxed{x \leq -1}$ hence, $S_1 =]-\infty; -1]$

Inequality (2):

$x^2 > -1$

so $x^2 + 1 > 0$

which is true for all real values of x (Sum of two real (+)ve no.s).

hence, $S_2 =]-\infty, +\infty[$