

$$\begin{array}{ccccc}
X' & \xrightarrow{i_X} & X & \xrightarrow{p_X} & X' \\
\downarrow a' \text{ Cofib} & & \downarrow c \text{ TCofib} & & \downarrow a' \text{ TCofib} \\
& & E & \xrightarrow{k} & P \\
& \nearrow s & \downarrow f \text{ TFib} & & \searrow l \\
Y' & \xrightarrow{i_Y} & Y & \xrightarrow{p_Y} & Y'
\end{array}$$

A commutative diagram illustrating a relationship between various objects and morphisms. The diagram is structured as follows:

- Top Row:**  $X' \xrightarrow{i_X} X \xrightarrow{p_X} X'$
- Bottom Row:**  $Y' \xrightarrow{i_Y} Y \xrightarrow{p_Y} Y'$
- Left Vertical Arrow:**  $a' : X' \rightarrow Y'$  (labeled **Cofib**)
- Right Vertical Arrow:**  $a' : X' \rightarrow Y'$  (labeled **TCofib**)
- Central Objects:**  $E$  and  $P$
- Morphisms to  $E$ :**
  - $c : X \rightarrow E$  (labeled **TCofib**)
  - $s : Y' \rightarrow E$  (dashed arrow)
- Morphisms from  $E$ :**
  - $f : E \rightarrow Y$  (labeled **TFib**)
- Morphisms to  $P$ :**
  - $k : E \rightarrow P$  (dashed arrow)
- Morphisms from  $P$ :**
  - $l : P \rightarrow Y'$  (dashed arrow)
- Commutativity:** A square symbol  $\square$  is placed near the top right, indicating that the diagram commutes.