4th exercise:

1- F belongs to (AB) (given)

(AB) // (DC) (opp. sides of a parm)

So, (BF) // (DC)

In Δ's EBF & EDC we have:

(BF) // (DC) (proved)

E belongs to [BC] & [FD] (given)

So, Apply Thales' property: Any st. line parallel to a side of a Δ it divides the sides of the Δ proportionally

Ratios: $\frac{EB}{EC} = \frac{EF}{ED} = \frac{BF}{DC}$ (1) (2) (3)

but DC = AB (opp. sides of a parm)

So, $\frac{EB}{EC} = \frac{BF}{AB}$.

2- BC = AD = 6cm (opp. sides of a parm)

E belong to [BC] (given)

then BC = BE + EC

6 = 2 + EC

EC = 4cm

From ratios (1) & (3):

$\frac{EB}{EC} = \frac{BF}{DC}$

$\frac{x}{6} = \frac{2}{4}$

$x = \frac{6}{2}$

$x = 4cm$