Problem 2.53

```
> restart;
> eq1:= -T[ACx] + T[BCx] - F[x]     = 0;
  eq2:=  T[ACy] + T[BCy] - F[y] - W = 0;
```

$$eq1 := -T_{ACx} + T_{BCx} - F_x = 0$$

$$eq2 := T_{ACy} + T_{BCy} - F_y - \mathrm{W} = 0$$

```
> eq3:= T[ACx] = T[AC]*sin(convert(36.87*degrees,radians));
  eq4:= T[ACy] = T[AC]*cos(convert(36.87*degrees,radians));
  eq5:= T[BCx] = T[BC]*cos(convert(28.07*degrees,radians));
  eq6:= T[BCy] = T[BC]*sin(convert(28.07*degrees,radians));
  eq7:= F[x]   =   680*cos(convert(28.07*degrees,radians));
  eq8:= F[y]   =   680*sin(convert(28.07*degrees,radians));
  eq9:= W      =   840;
```

$$eq3 := T_{ACx} = T_{AC} \sin(0.2048333333\,\pi)$$

$$eq4 := T_{ACy} = T_{AC} \cos(0.2048333333\,\pi)$$

$$eq5 := T_{BCx} = T_{BC} \cos(0.1559444444\,\pi)$$

$$eq6 := T_{BCy} = T_{BC} \sin(0.1559444444\,\pi)$$

$$eq7 := F_x = 680 \cos(0.1559444444\,\pi)$$

$$eq8 := F_y = 680 \sin(0.1559444444\,\pi)$$

$$eq9 := \mathrm{W} = 840$$

```
> eqA:= subs({eq3,eq5,eq7},eq1);
  eqB:= subs({eq4,eq6,eq8,eq9},eq2);
```

$$eqA := -T_{AC} \sin(0.2048333333\,\pi) + T_{BC} \cos(0.1559444444\,\pi) - 680 \cos(0.1559444444\,\pi) = 0$$

$$eqB := T_{AC} \cos(0.2048333333\,\pi) + T_{BC} \sin(0.1559444444\,\pi) - 680 \sin(0.1559444444\,\pi) - 840 = 0$$

```
> fsolve({eqA,eqB},{T[AC],T[BC]});
```

$$\{T_{AC} = 750.0226073,\ T_{BC} = 1190.004782\}$$

```
>
```