```
STUDENT > restart;
STUDENT >
STUDENT > # EQ1: Sum of horizontal forces is 0
STUDENT > equation1:=T1*cos(theta1) - T2*cos(theta2)  = 0 ;
```

$$equation1 := T1\cos(\theta 1) - T2\cos(\theta 2) = 0$$

```
STUDENT >
STUDENT > # EQ2: Sum of vertical forces is 0
STUDENT > equation2:=T1*sin(theta1) + T2*sin(theta2) - W = 0 ;
```

$$equation2 := T1\sin(\theta 1) + T2\sin(\theta 2) - W = 0$$

```
STUDENT >
STUDENT > # Solve 2 equations in 2 unknowns T1, T2
STUDENT > Solution:=simplify(solve({equation1,equation2},{T1,T2}));
```

$$Solution :=$$

$$\{T2 = \frac{\cos(\theta 1)\, W}{\cos(\theta 1)\sin(\theta 2) + \cos(\theta 2)\sin(\theta 1)}, T1 = \frac{W\cos(\theta 2)}{\cos(\theta 1)\sin(\theta 2) + \cos(\theta 2)\sin(\theta 1)}\}$$

```
STUDENT >
STUDENT > # Develop identity to simplify the denominator
STUDENT > identity1:= expand(sin(theta1+theta2))=sin(theta1+theta2);
```

$$identity1 := \cos(\theta 1)\sin(\theta 2) + \cos(\theta 2)\sin(\theta 1) = \sin(\theta 1 + \theta 2)$$

```
STUDENT >
STUDENT > # Use the identity to simplify the solution:
STUDENT > subs(identity1,Solution);
```

$$\{T2 = \frac{\cos(\theta 1)\, W}{\sin(\theta 1 + \theta 2)}, T1 = \frac{W\cos(\theta 2)}{\sin(\theta 1 + \theta 2)}\}$$