HW4-1 Soln)

Let's let 'up the escalator' be positive. Then when the person just stands on the escalator,

$v_{P,E} = 0$ and $v_{P,G} = v_{P,E} + v_{E,G} = v_{E,G} = \Delta x_{P,G}/t = +20/30 = +0.67$ m/s

Then, if he walks up the elevator such that $v_{P,E} = +0.6$ m/s,

$t = \Delta x_{P,G}/v_{P,G} = \Delta x_{P,G}/(v_{P,E} + v_{E,G}) = +20/(0.6 + 0.67) = $ <mark>15.7 seconds</mark>.

Then, if he walks down the elevator such that $v_{P,E} = -0.6$ m/s,

$t = \Delta x_{P,G}/v_{P,G} = \Delta x_{P,G}/(v_{P,E} + v_{E,G}) = +20/(-0.6 + 0.67) = $ <mark>285.7 seconds</mark>.