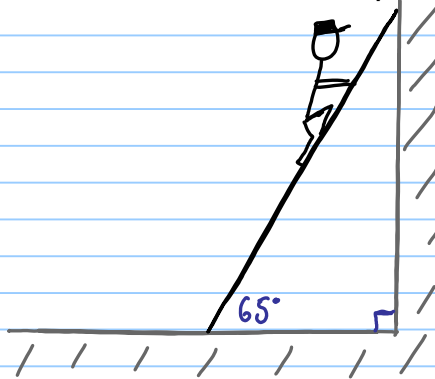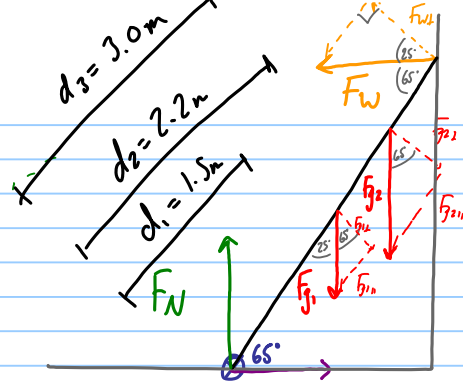A 3.0 m long, 12 kg ladder leans against a frictionless wall as shown. A 55 kg painter climbs 2.2 m up the ladder. What is the minimum coefficient of friction between the ladder and the ground such that the ladder doesn't slip?

$$\widetilde{\tau_c} = \widetilde{\tau_{cc}} \quad F_f \checkmark$$

$$F_{g1\perp} d_1 + F_{g2\perp} d_2 = F_{W\perp} d_3 \checkmark$$

$$F_{g1} \cos 65 \, d_1 + F_{g2} \cos 65 \, d_2 = F_W \cos 25 \, d_3$$

$$F_W = \frac{m_1 g \cos 65 \, d_1 + m_2 g \cos 65 \, d_2}{\cos 25 \, d_3} = \underline{211.73 \, N} =$$

$$F_f \checkmark = F_W = 211.73 \, N$$

$$F_N = F_{g1} + F_{g2} \checkmark = 656.6 \, N$$

$$F_f = \mu F_N \qquad \mu = \frac{F_f}{F_N} = 0.32 \checkmark$$