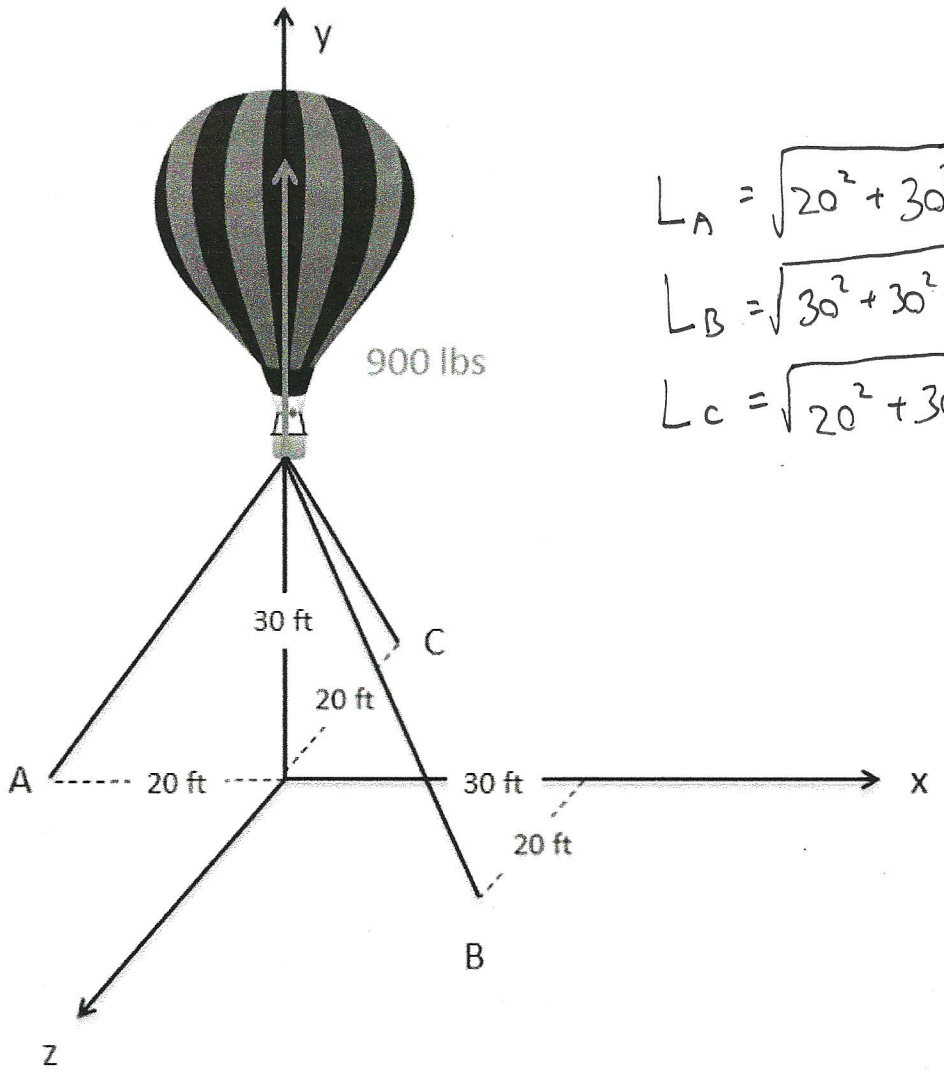
A hot air balloon is tethered to the ground with three cables as shown below. If the balloon is pulling upwards with a force of 900lbs, what is the tension in each of the three cables?



$L_A = \sqrt{20^2 + 30^2} = 36.1 \text{ ft}$

$L_B = \sqrt{30^2 + 30^2 + 20^2} = 46.9 \text{ ft}$

$L_C = \sqrt{20^2 + 30^2} = 36.1$

$T_{AX} = \frac{-20}{L_A} T_A = -.554 T_A$

$T_{AY} = \frac{-30}{L_A} T_A = -.831 T_A$

$T_{BX} = \frac{30}{L_B} T_B = .640 T_B$

$T_{BY} = \frac{-30}{L_B} T_B = -.640 T_B$

$T_{CX} = 0$

$T_{CY} = \frac{-30}{L_C} T_C = -.831 T_C$

$$T_{AZ} = 0$$

$$T_{BZ} = \frac{20}{L_B} T_B = .554\, T_B$$

$$T_{CZ} = -\frac{20}{L_C} T_C = -.426\, T_C$$

$$\sum F_x = -.554 T_A + .640 T_B = 0$$

$$\sum F_y = -.831 T_A - .640 T_B - .831 T_C + 900 = 0$$

$$\sum F_z = .554 T_B - .426 T_C = 0$$

Use computer tools to solve

$T_A = 387.9$ lbs

$T_B = 335.7$ lbs

$T_C = 436.6$ lbs