



$$\boxed{2} \quad \frac{30.0 \text{ mL H}_2\text{SO}_4}{1000 \text{ mL}} \left| \frac{2 \text{ mol H}_2\text{SO}_4}{1 \text{ mol H}_2\text{SO}_4} \right| \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{SO}_4} = 0.12 \text{ mol H}_2\text{O}$$

$$\frac{35.0 \text{ mL LiOH}}{1000 \text{ mL}} \left| \frac{1 \text{ mol LiOH}}{2 \text{ mol LiOH}} \right| \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol LiOH}} = 0.035 \text{ mol H}_2\text{O}$$

LiOH is LR

$$\boxed{3} \quad \frac{0.035 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}} \left| \frac{1 \text{ mol H}_2\text{SO}_4}{2 \text{ mol H}_2\text{O}} \right| = 0.0175 \text{ mol H}_2\text{SO}_4 \text{ used}$$

$$\frac{30.0 \text{ mL H}_2\text{SO}_4}{1000 \text{ mL}} \left| \frac{2 \text{ mol H}_2\text{SO}_4}{1 \text{ mol H}_2\text{SO}_4} \right| = 0.06 \text{ mol H}_2\text{SO}_4 \text{ started with}$$

$$0.06 \text{ mol H}_2\text{SO}_4 - 0.0175 \text{ mol H}_2\text{SO}_4 = 0.0425 \text{ mol H}_2\text{SO}_4 \text{ left}$$

$$\boxed{4} \quad \frac{0.0425 \text{ mol H}_2\text{SO}_4}{0.065 \text{ L}} = 0.654 \text{ M H}_2\text{SO}_4$$



$$\frac{0.654 \text{ mol H}_2\text{SO}_4}{\text{L}} \left| \frac{2 \text{ mol H}^+}{1 \text{ mol H}_2\text{SO}_4} \right| = 1.31 \text{ M H}^+$$

$$\text{pH} = -\log(1.31) = -0.11$$