Parallel and Perpendicular Lines

Class activity Pg 138 Act #3

Left graph annotations: A(2,3), A(3,1)

$$a = a'$$

$$\left(a = \frac{2}{3} \quad a' = \frac{2}{3} \right)$$
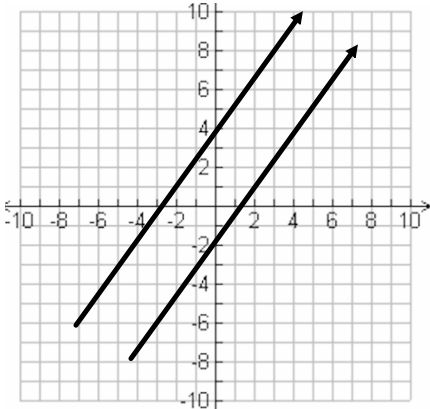
Right graph annotations: ℓ_1, A(1,2)
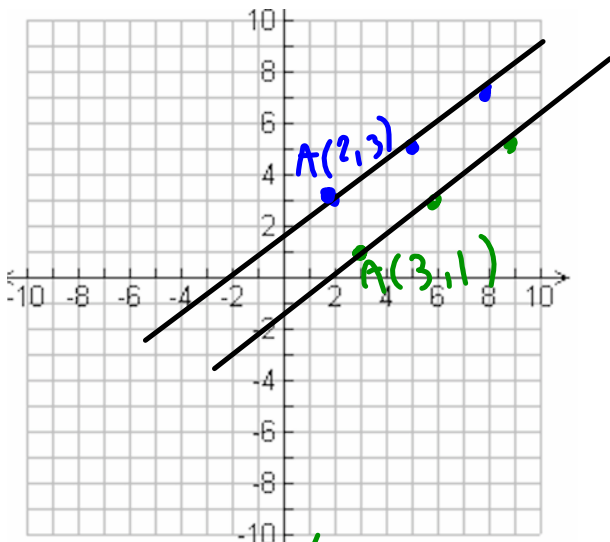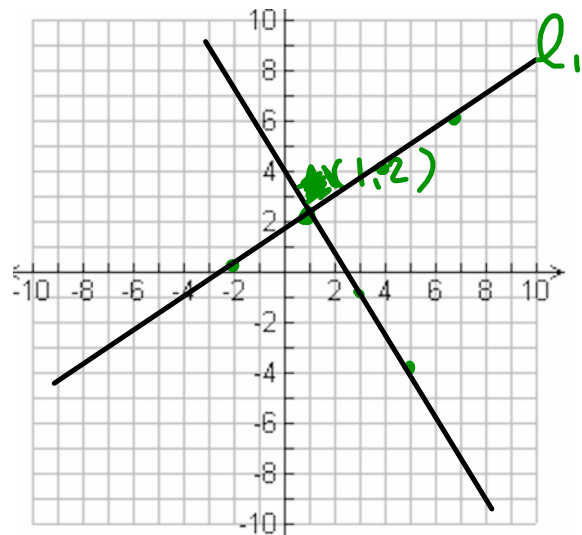
$$a = \frac{2}{3} \quad a' = -\frac{3}{2}$$

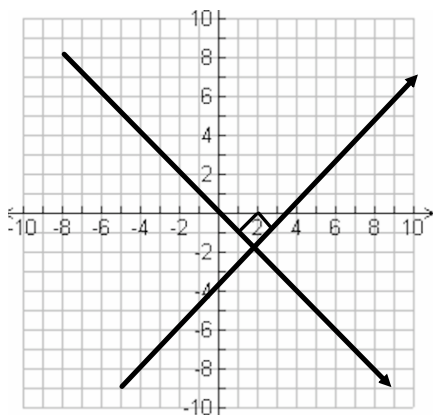Perpendicular

Conclusion:

Lines with the same slope are parallel.

$$l \parallel l' \longleftrightarrow a = a'$$

Lines with slopes that are negative reciprocals are perpendicular.

$$l \perp l' \longleftrightarrow a \cdot a' = -1$$

from previous example:

$$a = \frac{2}{3} \qquad a' = -\frac{3}{2}$$

$$a \cdot a' = -1$$

$$\frac{2}{3} \cdot -\frac{3}{2} = -\frac{6}{6} = -1 \checkmark$$