Geometry Notes Day 2

Name Key

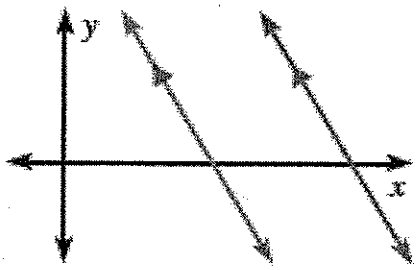
3.4 Find and Use Slopes of Lines

Slopes of Parallel and Perpendicular lines

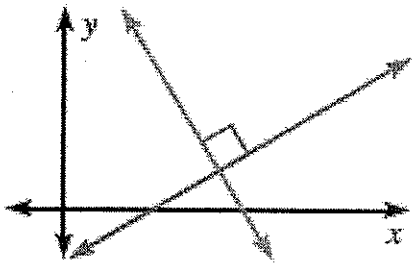
Parallel lines never intersect. Their slopes are the same.

Perpendicular lines intersect and form 4 right angles.

Their slopes are opposite signs (+/−) and reciprocals!



$m_1 = m_2$



$m_1 \cdot m_2 = -1$

Determine if each pair of lines is perpendicular, parallel, or neither.

1. Line 1: passes through (3, -1) and (6, -4)
   Line 2: passes through (-2, 5) and (-4, 7)

$m_1 = \frac{-4+1}{6-3} = \frac{-3}{3} = {}^{*}-1$

$m_2 = \frac{7-5}{-4+2} = \frac{2}{-2} = {}^{*}-1$

same slopes → parallel lines

2. Line 1: passes through (-3, 2) and (5, 0)
   Line 2: passes through (-1, -4) and (3, -3)

$m_1 = \frac{0-2}{5+3} = \frac{-2}{8} = {}^{*}-\frac{1}{4}$

$m_2 = \frac{-3+4}{3+1} = {}^{*}\frac{1}{4}$

neither → the lines will intersect

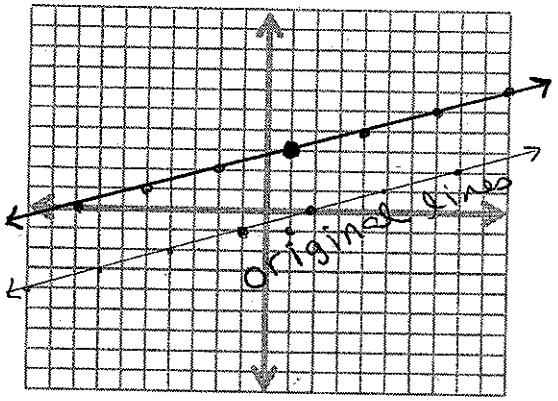
3. Line 1: passes through (-3, 2) and (5, 0)
   Line 2: passes through (2, -4) and (3, 0)

$m_1 = \frac{0-2}{5+3} = \frac{-2}{8} = -\frac{1}{4}$

$m_2 = \frac{0+4}{3-2} = \frac{4}{1} = 4$

opp signs/recips → perpendicular lines

4. Graph a line through point (1,3) and parallel to the line through (–1,–1) *and* (2,0).



$m = \frac{0+1}{2+1} = \frac{1}{3}$

* m // is also $\frac{1}{3}$

5. Find the slope of line n perpendicular to line h and passing through point P. Graph line n. Then find the slope of line k parallel to line h and passing through point P. Graph line k.

$m_h = \frac{-3+4}{-5-2} = \frac{1}{-7} = -\frac{1}{7}$

$\perp m_n \rightarrow \frac{7}{1} = 7$

$\parallel m_k = -\frac{1}{7}$

$\perp m = 7$

$\parallel m = -\frac{1}{7}$