

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

## Special Lines (Horizontal, Vertical, Perpendicular, Parallel, Identical), Distance, Midpoint

1. Pick any two points  $A$  &  $B$  on the coordinate plane that are not on an axis, and that do not have identical  $x$ -values or identical  $y$ -values. Write all three forms of the equation of the line through them. Graph points  $A$  &  $B$  and line  $AB$ . (For this sheet, always use different selections than other classmates.) Find the slope and  $x$  &  $y$  intercepts of line  $AB$ .
2. Pick another point  $C$  not on the line  $AB$  and write all three forms of the equation for a line through  $C$  and parallel to line  $AB$ . Graph point  $C$  and the new line, and label it  $j$ . Find the slope and  $x$  &  $y$  intercepts of line  $j$ .
3. Write all three forms of the equation for a line through  $C$  and perpendicular to line  $AB$ . Graph the new line, and label it  $k$ . Find the slope and  $x$  &  $y$  intercepts of line  $k$ .
4. Pick two of the equations from 1 and multiply each by a different constant. If you were given the resulting two equations and asked whether they were parallel, perpendicular, identical, or none of these, how would you proceed to find out?
5. Graph any line parallel to the  $x$ -axis and write its equation. What kind of line is it? How would you explain its equation in terms of points on it? What are its slope and  $x$  &  $y$  intercepts? How is it related to the  $y$ -axis?
6. Graph any line parallel to the  $y$ -axis and write its equation. What kind of line is it? How would you explain its equation in terms of points on it? What are its slope and  $x$  &  $y$  intercepts? How is it related to the  $x$ -axis?
7. How are the lines in 5 and 6 related?
8. Find the point of intersection of line  $AB$  and line  $k$ . Name the point  $D$  and graph it.
9. Find the distance between line  $AB$  and line  $j$ . (Remember the Pythagorean Theorem?)
10. Find the midpoint of segment  $CD$ . Name the point  $M$  and graph it.