

Unit 3

Equations of Lines

Grade 10 Applied

Lesson Outline

BIG PICTURE			
Students will:			
<ul style="list-style-type: none"> manipulate and solve algebraic equations, to solve problems; graph a line and write the equation of a line from given information. 			
Day	Lesson Title	Math Learning Goals	Expectations
1	A Triggy Slope <i>(lesson not included)</i>	<ul style="list-style-type: none"> Connect the idea of slope to the tangent ratio from the trigonometry unit. Define the slope of a line as the ratio $m = \frac{\text{rise}}{\text{run}}$. Determine the slopes of various lines. 	ML2.01 CGE 3b, 5a
2	Slippery Slopes <i>(lesson not included)</i>	<ul style="list-style-type: none"> Investigate the properties of the slopes of lines and line segments, using graphing calculators. Investigate the steepness of lines, from their graphs. Identify similarities and differences between lines with positive and negative slopes and parallel lines. Use GSP[®]4 and the plot points feature to find slopes of various lines to determine their characteristics. 	ML2.04 CGE 4f
3	Reading the Line <i>(lesson not included)</i>	<ul style="list-style-type: none"> Investigate the graphs of lines. Identify that $y = mx + b$ is a common form of the equation of lines. Investigate the special cases $x = a$ and $y = b$. 	ML2.02 CGE 5b, 5a
4	Interpreting the Relationship <i>(lesson not included)</i>	<ul style="list-style-type: none"> Collect data on linear relations using technology. Determine the equation of the linear relation. Make connections between the initial value and the rate of change in the relation to the y-intercept and slope of the equation of the line. 	ML2.03 CGE 5b, 7b
5, 6	Equations of Lines <i>(lessons not included)</i>	<ul style="list-style-type: none"> Investigate with technology the graphs of a variety of lines. Identify the geometric significance of m and b in the equation $y = mx + b$. Determine the equation of a line, given the slope and y-intercept. Write linear equations for relationships, e.g., an electrician charges \$65 as a base fee and \$35 for each hour. Given an equation, write a story. 	ML2.01, ML2.02, ML2.03, ML2.04, ML2.06 CGE 3c, 4b
7	Writing Equations of Lines <i>(lesson not included)</i>	<ul style="list-style-type: none"> Graph lines by hand using the y-intercept and slope given the equation in slope/y-intercept form. Express the equation of a line in the form $y = mx + b$, given the form $ax + by + c = 0$. 	ML1.03, ML2.05 CGE 5b

Day	Lesson Title	Math Learning Goals	Expectations
8	It's About Intercepts <i>(lesson not included)</i>	<ul style="list-style-type: none"> Review x- and y-intercepts. Discuss how you would determine the x- and y-intercepts, given an equation in standard form. Graph lines by hand, given the form $ax + by = c$, using the x- and y-intercepts. Solve first-degree equations involving one variable. 	ML1.01, ML2.05 CGE, 5a, 5e
9	Putting It Together <i>(lesson not included)</i>	<ul style="list-style-type: none"> Create a concept map in groups to demonstrate their collective knowledge about determining the equation of a line given its graph. Post concept maps and rotate around the room to study other groups' concept maps. Revise their own concept maps, as necessary. 	ML2.03, ML2.06 CGE 2c, 5e
10	How Can We Use This? <i>(lesson not included)</i>	<ul style="list-style-type: none"> Given a point and a slope, construct a line. Determine the equation of the line. Determine the equations of several lines in a pair/share activity. 	ML2.05, ML2.06 CGE 5b
12	Getting the Equations <i>(lesson not included)</i>	<ul style="list-style-type: none"> Construct a line, given two points. Determine the slope and the y-intercept. Determine the equation of the line. 	ML2.05, ML2.06 CGE 3c, 5b
13	Summative Assessment		