

Lesson 8: Functions
 Function an equation where an x value is linked with
 only 1 y value.
 Linear Function makes a straight line

Using Ordered Pairs to Make a Graph, Table, and Mapping
 Shows all of the x values
 Shows all of the y values

a) $(0, 3), (1, 2), (2, 3), (3, 4)$
 Domain: $\{0, 1, 2, 3\}$
 Range: $\{2, 3, 4\}$

b) $(-2, 1), (-1, 3), (0, 5), (1, 8), (2, 10)$
 Domain: $\{-2, -1, 0, 1, 2\}$
 Range: $\{1, 3, 5, 8, 10\}$

Deciding if its a Function and, if so, is it Linear or Nonlinear?

From a Graph
 Show a vertical line over parts of the graph.
 If it touches more than once it is not a function.
 This is called the VERTICAL LINE TEST.
 If it passes the V.L.T. and if the line is completely straight, it is a linear function. If not, it is nonlinear.

What do you think?

From Sets of Ordered Pairs
 - Function: as a value can repeat
 - Linear Function: has to change by a constant rate

a) $(-3, 2), (-2, 3), (-1, 4), (0, 5)$ Linear Function
 b) $(-2, 1), (-1, 3), (0, 5), (1, 8), (2, 10)$ Linear Function
 c) $(-2, 1), (-1, 3), (0, 5), (1, 8), (2, 10)$ Linear Function
 d) $(-2, 1), (-1, 3), (0, 5), (1, 8), (2, 10)$ Linear Function

From an Equation
 - convert from an equation to under a square root sign, or be in the denominator

Writing Linear Equations from Given Information
 - When given the slope and y-intercept
 - Just plug in slope for m and y-intercept for b

a) slope = 5, y-intercept = 6 $y = 5x + 6$
 b) slope = 2/5, y-intercept = 2 $y = \frac{2}{5}x + 2$

When given the slope and an ordered pair
 - Plug in the slope for m
 - Use the ordered pair to plug in for x and y
 - Solve for b
 - Plug in then use the b

a) $(-2, 3)$ slope = 3 $y = 3x + 9$
 b) $(6, 7)$ slope = 1/3 $y = \frac{1}{3}x + 6$

When given two points
 - Use slope formula to find the slope
 - Follow the steps above to find b

a) $(2, 2), (3, 10)$ $y = 8x - 14$
 b) $(-4, 4), (0, 8)$ $y = x + 4$

When parallel or perpendicular line
 - Parallel: same slope
 - Perpendicular: opposite, reciprocal slope
 - Find one slope, plug it in, then solve for b

a) parallel to $y = 2x + 3$ and pass through $(2, 2)$ $y = 2x - 2$
 b) perp to $y = 2x + 3$ and pass through $(5, 5)$ $y = -\frac{1}{2}x + \frac{13}{2}$

When slope given
 - write first when given the slope and an ordered pair or two ordered pairs
 - use the formula $y - y_1 = m(x - x_1)$

a) slope = 6 through $(1, -6)$ $y - (-6) = 6(x - 1)$
 $y + 6 = 6x - 6$
 $y = 6x - 12$

b) through $(4, 0)$ and $(0, 4)$ $y - 0 = -1(x - 4)$
 $y = -x + 4$