

Math 1314 – College Algebra

Section 4.1-4.2 Linear Functions/Modeling with Linear Functions

RECALL:

- The slope, m , of the line containing the points $P(x_0, y_0)$ and $Q(x_1, y_1)$ is: $m = \frac{y_1 - y_0}{x_1 - x_0} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$
- The point-slope form of the line with slope m containing the point (x_0, y_0) is the equation: $(y - y_0) = m(x - x_0)$
- The slope-intercept form of the line with slope m and y -intercept $(0, b)$ is the equation: $y = mx + b$
- A linear function is a function of the form $f(x) = mx + b$, where m and b are real numbers, with $m \neq 0$. The domain of a linear function is $(-\infty, \infty)$.
- A constant function is a function of the form $f(x) = b$, where b is a real number. The domain of a constant function is $(-\infty, \infty)$.
- Two lines are parallel if and only if their slopes are identical.
- Two lines are perpendicular if and only if the product of their slopes is -1 . (or their slopes are negative reciprocals of each other).

Ex: Find a linear equation for $f(x)$ if $f(100) = 3.92$ and $f(0) = 1$.

Ex: The pressure p of water on a diver's body is a linear function of the diver's depth, x . At the water's surface, the pressure is 1 atmosphere. At a depth of 100 ft, the pressure is approximately 3.92 atmospheres.

(a) Find the linear function that relates p to x .

(b) Compute the pressure at a depth of 10 fathoms. (*Note:* 1 fathom = 6 ft.)

