

Math 121 – Section 3.1 Solutions

14. $g(x) = 5x - 4$

- (a) the slope is 5 and the y -intercept is -4
- (c) the average rate of change is 5, i.e. the slope
- (d) the function is increasing because the slope is positive

24. The function is linear because when $\Delta x = 1$ we have $\Delta y = 4$. The slope is then:

$$\text{slope} = \frac{\Delta y}{\Delta x} = 4$$

29. $f(x) = 4x - 1$, $g(x) = -2x + 5$

- (a) The solution to $f(x) = 0$ is $x = \frac{1}{4}$.
- (b) The solution to $f(x) > 0$ is $x > \frac{1}{4}$.
- (c) The solution to $f(x) = g(x)$ is:

$$\begin{aligned} f(x) &= g(x) \\ 4x - 1 &= -2x + 5 \\ 6x &= 6 \\ x &= 1 \end{aligned}$$

- (d) The solution to $f(x) \leq g(x)$ is:

$$\begin{aligned} f(x) &\leq g(x) \\ 4x - 1 &\leq -2x + 5 \\ 6x &\leq 6 \\ x &\leq 1 \end{aligned}$$

32. Using the figure given in the book:

- (a) The solution to $g(x) = 20$ is $x = 5$.
- (b) The solution to $g(x) = 60$ is $x = -15$.
- (c) The solution to $g(x) = 0$ is $x = 15$.
- (d) The solution to $g(x) > 20$ is $x < 5$.
- (e) The solution to $g(x) \leq 60$ is $x \geq -15$.
- (f) The solution to $0 < g(x) < 60$ is $-15 < x < 15$.

38. Using the function $C(x) = 0.38x + 5$, where C is the monthly cost, in dollars, for international calls on a phone and x is the number of minutes used:

- (a) $C(50) = 0.38(50) + 5 = 24$ dollars

(b) If $C(x) = 29.32$ then:

$$0.38x + 5 = 29.32$$

$$0.38x = 24.32$$

$$x = \frac{24.32}{0.38}$$

$$x = 64 \text{ minutes}$$

(c) If you budget \$60 per month, then the maximum number of minutes you can talk is:

$$0.38x + 5 = 60$$

$$0.38x = 55$$

$$x = \frac{55}{0.38}$$

$$x \approx 177.74 \text{ minutes}$$

Therefore, the maximum number of minutes you can talk is 177 minutes.