

Worksheet 1 KEY – Functional Notation (§3.2)

1.

$$\begin{array}{lll} \text{(a)} h(7) = -3 & \text{(c)} f(7) = 2 & \text{(e)} k(2) = 3 \\ \text{(b)} h(123,456) = -3 & \text{(d)} x = 28 & \text{(f)} x = 1 \end{array}$$

2.

$$\begin{array}{ll} \text{(a)} f(a) = a^2 - 2 & \text{(c)} g(x - 2) = 2x - 7 \\ \text{(b)} f(a + 1) = a^2 + 2a - 1 & \text{(d)} g(x + h) - g(x) = 2h \end{array}$$

3.

$$\begin{array}{lll} \text{(a)} -3 & \text{(c)} -2x - h + 2 & \text{(e)} \frac{1}{\sqrt{x+h} + \sqrt{x}} \\ \text{(b)} 0 & \text{(d)} 3x^2 + 3xh + h^2 & \text{(f)} -\frac{1}{x(x+h)} \end{array}$$

4.

$$\begin{array}{lll} \text{(a)} \mathbb{R} & \text{(e)} (-\infty, 3] & \text{(i)} \left(\frac{1}{3}, \infty\right) \\ \text{(b)} \{x: x \neq -1\} & \text{(f)} (-\infty, 3) & \text{(j)} \{x: x \geq 0 \text{ and } x \neq 25\} \\ \text{(c)} \mathbb{R} & \text{(g)} \mathbb{R} & \text{(k)} \left\{x: x \geq \frac{1}{3} \text{ and } x \neq 3\right\} \\ \text{(d)} \{x: x \neq 6, -6\} & \text{(h)} \{x: x \neq -2, 1\} & \text{(l)} [7, 9] \end{array}$$

5. $U(0) = 60$ means there is initially 60 g of unconverted substance. The solution of $h(t) = 0$ is $t = 1$ and means at 1 second, there is 10 g of unconverted substance left.

6. $h(0) = 64$ means the building is 64 feet high. The solution of $h(t) = 0$ is $t = 2$ ($t = -2$ is discarded) and means that at 2 seconds, the object hits the ground

7. $T(0) = 3$ means that the temperature is $3^\circ F$ at 6AM. $T(6) = 33$ means the temperature is $33^\circ F$ at noon. $T(12) = 27$ means that the temperature is $27^\circ F$ at 6PM.

8. $P(0) = 0$ means there are no pythons in the county in the year 1800. $P(205) = \frac{3075}{22} \approx 139.77$ means there are approximately 140 pythons in the county in the year 2005.