1. Define the following:

   (a) Function:

   (b) Linear function:

   (c) Quadratic function:

   (d) Polynomial:

   (e) Maximum of a function:

2. What do each of the following symbols denote:

   (a) $\mathbb{Z}$:

   (b) $\mathbb{Q}$:

   (c) $\mathbb{R}$:

   (d) i:

   (e) α:

   (f) Ω:

3. Let $f(x) = 3x^2 + 2x + 1$ and $g(x) = 4x + 1$. Evaluate the following:

   (a) $f(-3)$:

   (b) $f\left(\frac{2}{5}\right)$:

   (c) $f(g(2))$:

4. Solve the following:

   (a) $4x - 7 = 23x + 3$:

   (b) $x^2 - 1 = 0$:

   (c) $3x^2 + 4x = 5x - 7$:

   (d) $4(3x - 5)^2 + x^2 - 45x + 33 = 2(x + 2)^2 - x + 23 + 3x^2$:

   (e) $x^2 + 1 = 0$:

   (f) $\sin(x) = 0$:

5. Put the following into vertex form:

   (a) $f(x) = x^2 + 5x + 1$:

   (b) $g(x) = ax^2 + bx + c$:

6. Find the maximum/minimum of the following:

   (a) $f(x) = x^2 + 4$:

   (b) $h(x) = 7x + 1$:

7. Find the equation of the line perpendicular to $f(x) = 3x + 1$ passing through $(x, f(x)) = (1, 4)$

8. Sketch the following functions:

   (a) $f(x) = x^2$

   (b) $f(x) = x$

   (c) $f(x) = \sin(x)$

9. Solve the following for x and y:

$$\begin{cases} 2x + 3y = 4 \\ \frac{2}{3}x + \pi y = \sqrt{2} \end{cases}$$