

**Problem 1.** Sketch the graph of the function  $f(x) = 2x^2 - 8x + 5$ . Determine the range of  $f$ .

**Problem 2.** Determine the domain of the following functions.

$$f(x) = \frac{1}{\sqrt{x-2}}; \quad g(x) = \frac{2x+3}{x^2-3x-4}; \quad h(x) = \ln(\sin x)$$

**Problem 3.** Sketch the graph of the following functions

$$f(x) = \sin(2x); \quad g(x) = \sin\left(2x - \frac{\pi}{3}\right); \quad h(x) = 3 \sin\left(2x - \frac{\pi}{3}\right) - 1$$

What is the range of  $h(x)$ ?

**Problem 4.** Given the formulas

$$\cos(2x) = 2 \cos^2 x - 1; \quad \cos(2x) = 1 - 2 \sin^2 x$$

Determine the range of the function  $f(x) = \cos(2x) + 2 \sin x$ .