1. Let $f(x) = x^2 - 1$ and let $g(x) = 3x - 1$ Compute the following:

   (a) $(f - g)(2)$ (b) $(f \cdot g)(x)$ (c) $(f \circ g)(x)$ (d) $g(f(x))$
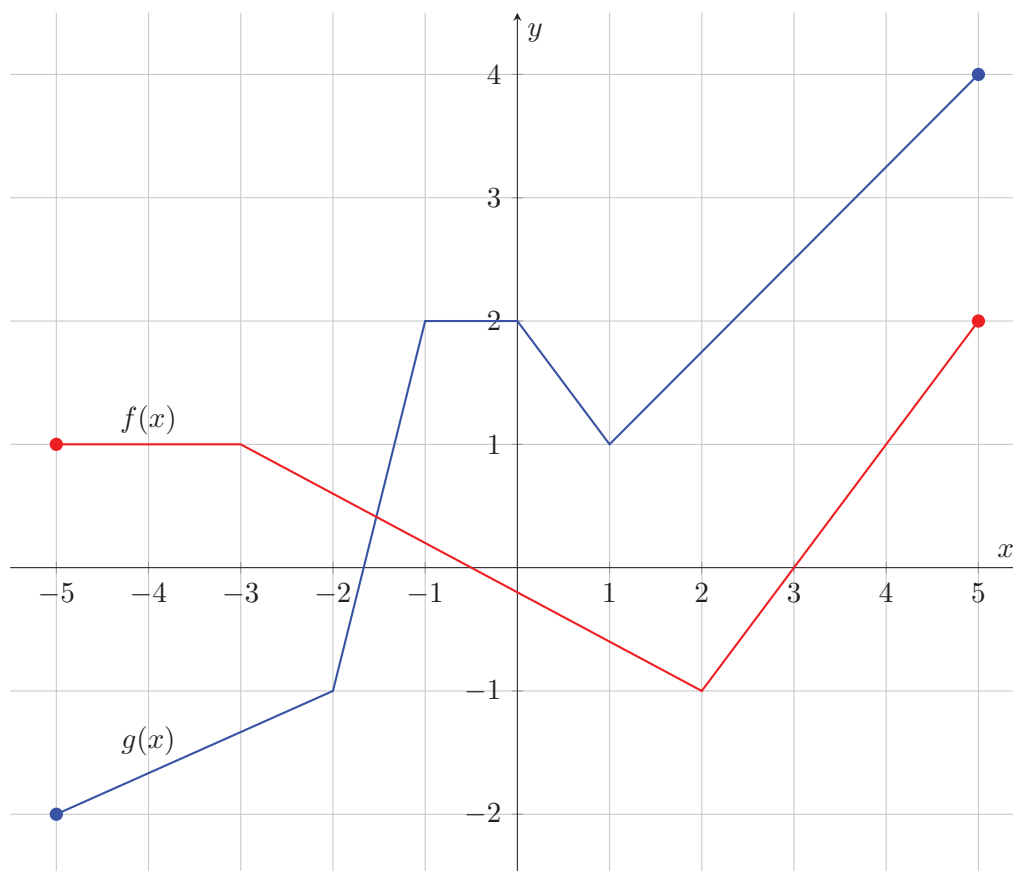
2. Let $f(x) = \sqrt[3]{x}$, $g(x) = x^2 - \dfrac{5}{x}$ and $h(x) = \dfrac{2}{2x+1}$. Compute the following

   (a) $\dfrac{1}{h(x)} - \dfrac{1}{2}$ (b) $\dfrac{h(x)}{\sqrt{3}}$ (c) $g(h(x))$

3. Let $f(x) = \sqrt{x}$, $g(x) = x^2 + 2x$ and $h(x) = \dfrac{3}{x}$. Express each of the following in terms of f, g, and h.

   (a) $\dfrac{3}{x^2 + 2x}$ (b) $\dfrac{3}{\sqrt{x}}$ (c) $\dfrac{1}{x^2} + \dfrac{2}{x}$

4. Consider the graphs of f and g. Compute the following exactly.

   (a) $(g + f)(-5)$ (c) $(f \circ g)(5)$ (e) $(g \circ g)(-2)$
   (b) $g(5)$ (d) $f(-g(0))$ (f) Give an exact value for $f(1)$.

5. Which of the following are exponential functions?

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

   (b) $g(x) = x^2$

   (c) $h(x) = 2^x$

   (d) $j(x) = 1^x$

   (e) $k(x) = \pi^x$

   (f) $\ell(x) = (-2)^x$

6. Graph $y = 2^x$ and $y = 3^x$ on the same set of axis.

   (a) Where do the two curves intersect?

   (b) On which intervals is $2^x > 0$?

   (c) On which intervals is $2^x < 3^x$?

   (d) Consider $y = (2.71828)^x$.

      i. For which x values is $3^x < (2.71828)^x < 2^x$?

      ii. For which x values is $3^x = (2.71828)^x = 2^x$?

7. Consider the exponential function $f(x) = b^x$. What b guarantees that the graph of $f(x)$ will pass through the point $\left(-3, \ \dfrac{1}{343}\right)$