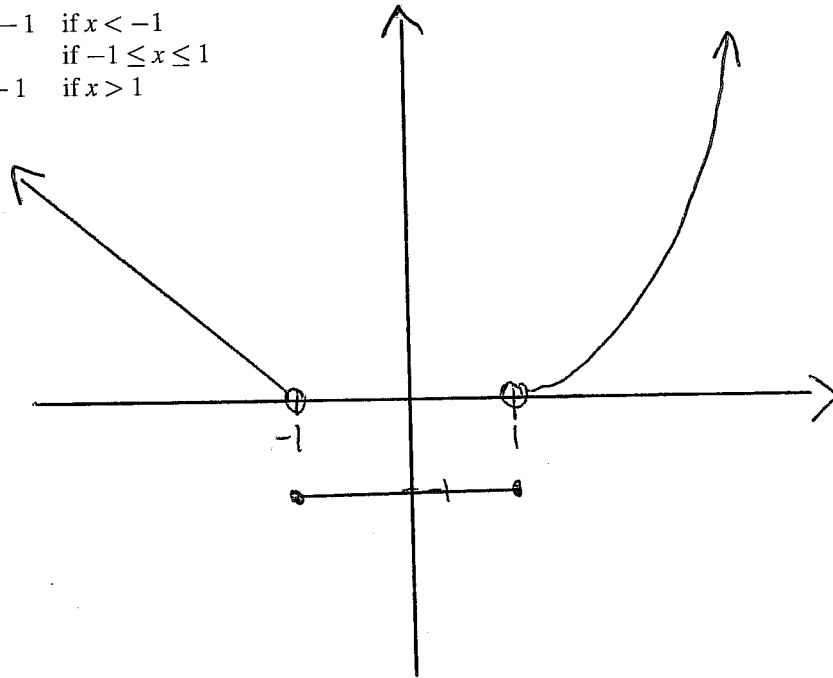


Quiz 6

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. pg.110#2 (5 marks) Graph the following piece-wise function:

$$f(x) = \begin{cases} -x-1 & \text{if } x < -1 \\ -1 & \text{if } -1 \leq x \leq 1 \\ x^2-1 & \text{if } x > 1 \end{cases}$$



Question 2. pg.117#18 (2 marks) Let $f(x) = \frac{1}{\sqrt{x-3}}$ and $g(x) = \frac{2}{x+1}$, then find $(g \circ f)(x)$ and $(f \circ g)(x)$. Do not simplify

$$\begin{aligned} (g \circ f)(x) &= g(f(x)) \\ &= g\left(\frac{1}{\sqrt{x-3}}\right) = \frac{2}{\frac{1}{\sqrt{x-3}} + 1} \end{aligned}$$

$$\begin{aligned} (f \circ g)(x) &= f(g(x)) \\ &= f\left(\frac{2}{x+1}\right) \\ &= \frac{1}{\sqrt{\frac{2}{x+1}} + 1} \end{aligned}$$

Question 3. pg.125#5n (5 marks) If $f(x) = \sqrt[3]{\frac{5x+1}{2}} - 3$ then find $f^{-1}(x)$.

$$\begin{aligned} y &= \sqrt[3]{\frac{5x+1}{2}} - 3 \\ x &= \sqrt[3]{\frac{5y+1}{2}} - 3 \\ x+3 &= \sqrt[3]{\frac{5y+1}{2}} \\ (x+3)^3 &= \frac{5y+1}{2} \\ 2(x+3)^3 &= 5y+1 \\ 2(x+3)^3 - 1 &= 5y \end{aligned}$$

$$\begin{aligned} y &= \frac{2(x+3)^3 - 1}{5} \\ f^{-1}(x) &= \frac{2(x+3)^3 - 1}{5} \end{aligned}$$