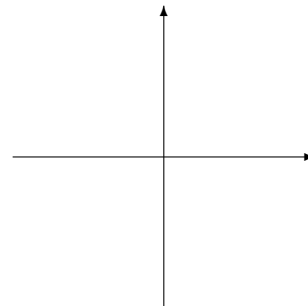


This guide gives some sample questions for the test on Pre-Calculus. See also the MATH 2301 Calculus I handbook and MATH 1300 Precalculus website.

1. Verify the identity $\frac{1}{1 - \cos(\theta)} + \frac{1}{1 + \cos(\theta)} = 2 \csc^2(\theta)$.
2. Solve the following equation for x : $\log_3(x - 4) + \log_3(x + 4) = 2$.
3. The function $f(x) = -7 + \sqrt[3]{4x - 5}$ is one-to-one on its domain.
 - (a) Find a formula for its inverse, $f^{-1}(x)$.
 - (b) Verify your formula is correct by computing and simplifying $f \circ f^{-1}(x)$.
4. Consider the rational function

$$f(x) = \frac{3x^2 - 3x}{x^2 - 5x + 4}.$$

- (a) Express the domain of f in interval notation.
- (b) Find the x and y intercepts of f .
- (c) Find all vertical and horizontal asymptotes.
- (d) Identify any holes.
- (e) Sketch a detailed graph of f .



5. Simplify and cancel so that you can plug in the given value without dividing by 0.

- (a) For $x = 2$, $\frac{x^2 + x - 6}{x - 2} =$
- (b) For $x = 4$, $\frac{\sqrt{x} - 2}{x - 4} =$
- (c) For $h = 0$, $\frac{(x + h)^2 - x^2}{h} =$
- (d) For $h = 0$, $\frac{(x + h)^{-1} - x^{-1}}{h} =$